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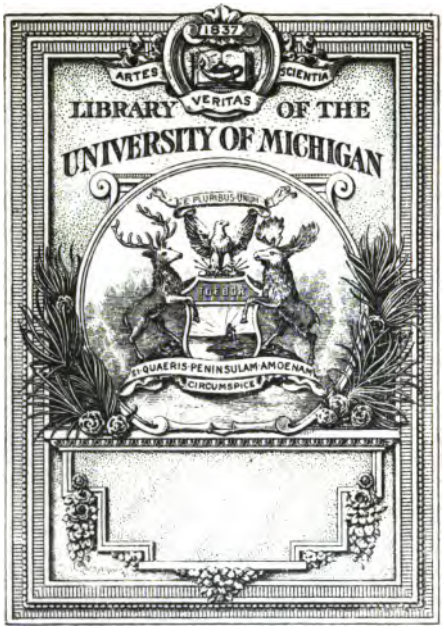

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THE SCIENTIFIC BASIS OF HOMŒOPATHY.

BY WILLIAM H. HOLCOMBE, M. D.

"Medicinæ leges naturæ legibus debent esse consentaneæ."—FERNELIUS.

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TO

THE MEDICAL PROFESSION

IN THE UNITED STATES,

THIS HUMBLE ENDEAVOR

TO POINT OUT SOME OF THE CORRELATIONS OF

PHYSICAL AND MEDICAL SCIENCE,

IS RESPECTFULLY DEDICATED,

BY THE AUTHOR.

It is interesting to trace the principles by which a man of cultivated mind is influenced in receiving, upon testimony, statements which are rejected by the vulgar as totally incredible.

1st. He is influenced by the recollection that at one time many things appeared to him marvelous, which he now knows to be true: and he thence concludes that there may still be in nature many phenomena and many principles with which he is entirely unacquainted. In other words, he has learned from experience not to make his own knowledge the test of probability.

2d. He is greatly influenced by perceiving in the statement some element of probability, or any kind of sequence or relation by which the alleged fact may be connected with principles which are known to him. It is in this manner that the freezing of water, which was rejected by the king of Siam as an incredible falsehood, might have appeared credible to a philosopher who had attended to the properties of heat, because he would have perceived in the statement a chain of relations connecting it with facts which he knew to be true.

3d. He is much guided by his power of discriminating the credibility of testimony, or of distinguishing that species and that amount of it, which he feels to be unworthy of absolute credit, from that on which he relies with as implicit confidence as on the uniformity of the course of nature. The vulgar mind is often unable to make the necessary discrimination in this respect, and is, therefore, apt to fall into one of the extremes of credulity and scepticism.

ABERCROMBIE *on the Intellectual Powers. Article Testimony.*

PREFACE.

After a theoretical and practical examination of Homœopathy, extending over a period of two years and a half, and marked by many fluctuations of opinion, I have enrolled myself as an humble advocate of what I consider to be the most comprehensive, and the least understood, of all the systems of Medicine. I have, therefore, withdrawn from the Medico-Chirurgical Society of Cincinnati, not as from a scientific association, willing to debate fully and liberally a scientific question, but as from a private party of gentlemen to whom my opinions and practice had become obnoxious. Indifferent as I am to the sentiments of those who condemn without trial, and sneer without knowledge, and whose vituperation is proportioned to their ignorance, as some animals are said to be fiercest in the dark, I am duly solicitous for the approval of the wise, and the respect of the good. I have therefore embodied in a few essays, and in the shape of an appeal to candid and intelligent physicians, my own reasons for leaving the beaten track of the profession.

I have given no statement of cases, for such have been often published before, and may be found in almost every number of the Homœopathic journals. They have been the source of more caviling than conviction. Nothing is easier than to construct a medical report, except the facility with which the whole of it may be explained away. Besides, I have not kept that careful and faithful record which alone should be submitted to professional scrutiny. The impressions and convictions of my own mind could not be transferred

to others by the mere statement of my limited experience. But to collect facts and to philosophize upon them are different processes, equally necessary to the establishment of truth. The facts already collected from indiscriminate sources, are, in my opinion, amply sufficient to substantiate all the claims of Homœopathy. These I have endeavored to present in a novel and attractive light. Two things I have especially labored to show: Firstly, that Allopathists have hitherto made men of straw, generally rude effigies of Hahnemann, which they have mistaken for Homœopathy, and demolished with apparent satisfaction, while the real points at issue have been left untouched and frequently undiscovered. Secondly, that the rationality of the Homœopathic doctrines becomes more and more perceptible as we extend our survey of the facts and principles of modern science.

Upon most of the members of the profession, this appeal, sharing the fate of its predecessors, will fall like the Scripture seed into stony ground. Many of them are bound to their present opinions by ties of interest, affection, and implicit faith, which it would be expecting almost too much of human nature to sever. Others have been long and publicly committed to the exposition of their dogmas. Some are too indolent to investigate, and not a few are too timid to accept. But with all this, there are intelligent and conscientious men, who constitute the van-guard of science, and are as ready to welcome her friends as to give battle to her enemies. They are conscious that the bow of Medical philosophy has not been stretched to the farthest, and are too modest and cautious either to affirm or deny any proposition until it has been submitted to the touchstone of experimental criticism. They are not only willing, but anxious to hear, being aware that he who has never changed his opinions, has never corrected his errors. And above all, they are not to be deterred from the path of duty by the scowl of sus-

picion or the whisper of calumny. With such I would "fit audience find, though few."

Their especial attention I would direct to the Undulatory Theories of Function, Disease, Medicinal Action and Cure here submitted. These titles are rather vague and inexpressive, but they are the best I could adopt, being derived from a theoretic view of the nature and modifications of the Nerve Force. It is an attempt to establish Homœopathy on the broadest possible physical basis. Impressed with the harmony and universality of natural laws, it has been my ambition to look at Medical Science with something of that spirit with which Humboldt delighted to survey the Cosmos. Accordingly I have indulged in some speculations of general physiological interest, but which have no direct bearing upon Homœopathy, except to render the theory more stable by widening its foundation. I claim nothing as original but a peculiar synthesis of facts and ideas which are common property. Every action of the human mind at the present day, is but the turn of the kaleidescope, which only gives a new form to the same materials. Although dogmatically expressed, I would have it remembered that this theory is tendered as a sheer speculation. Homœopathy is too securely based upon experience, from which there is no appeal, to be shaken by the downfall of any hypothesis. If the blast of criticism should blow the structure which I have reared to the ground, the fault will lie only in the unskillfulness of the builder.

I am ready to concede that my theory of Homœopathy will not stand the test of *logical* analysis. If it did, it would stand alone in the midst of ruins, in the midst of all the theories which have been ever contributed toward the philosophy of medicine. The materials of medicine are too imperfect for us to deduce from them the general principles and immutable laws which would place it securely among the positive sciences. Homœopathy has to contend with the

obstacles which have impeded the progress of Allopathy, and indeed, of all the departments of human knowledge; ambiguity of terms, looseness of statement, hasty generalization, intermixture of deficient observation and inconclusive inference, and innumerable sources of fallacy. The pretense of employing successfully the inductive method in the present state of Therapeutics, is a pedantic mockery. It was a golden axiom of Bacon, that "truth emerges sooner from error than from confusion," and the proper question is, not whether a theory be true or false, but to what extent will it harmonize and explain phenomena?

The gray streaks, however, which indicate the dawn of a better era, are already visible. The possibility of associating Medical and Physical Science by a nexus of common laws is becoming more apparent. Of all Allopathic Journals, the British and Foreign Medico-Chirurgical Review has given the readiest welcome and most forcible expression both to new truths and to new modes of looking at old truths. Homœopathy alone has never received justice at its hands. Much of the spirit and matter of this little work has been drawn from its pages. Notwithstanding its literary and scientific character, for which it is unrivalled in the English language, the liberality and comprehensiveness of its views have excited the suspicions and attacks of some of its bigoted and inferior coadjutors.

One important department I have entirely omitted, viz., that which may be called the *psychological* phasis of Homœopathy. This has been done from no inappreciation of its immense value, but from a sense of its uncertainty. The mental condition of a patient is always taken into consideration by the Homœopathic practitioner. Abnormal states of the mind can be both produced and cured by drugs acting on the organic media of mind. But the laws which govern the connection of soul and body have never yet received any

definite expression. Theory would be so entirely conjectural that it is better to wait patiently for a greater accumulation of facts. These facts lie in a field which is seldom worked by medical laborers. The British and Foreign Medico-Chirurgical Review in a long and brilliant article on Odyle, Mesmerism, Electro-Biology, etc., observes, "nevertheless, these books and the phenomena which they record, are equally interesting; the books as pregnant warnings against an erroneous method of scientific inquiry; the phenomena, as being destined to lay the foundation for a complete revolution in metaphysics and mental philosophy." This revolution will never be perfected until competent medical men take the median line of Physiology and Psychology out of the hands of charlatans and itinerant lecturers. A sounder metaphysics will be the best forerunner of Homœopathic truths, but until this has been constructed by ample observation and experiment, our circle of exposition must have a smaller, although more positive area.

Whilst I have not hesitated to expose error and to denounce injustice, I have contented myself with the defense of Rome, without carrying the war into Africa. It is not the object of this treatise to declaim against Allopathy as a system of practice. I have no disposition to trumpet its occasional abuses in order to make men oblivious of its innumerable benefits. I do not claim for Homœopathy an exclusive value, but only a superiority which it is prepared to maintain. Those who are rich in resources can afford to be magnanimous. Allopathy is the old, time-worn, uneven, zig-zag road, which the unprogressive continue to travel in memory of their fathers. Homœopathy is the recently constructed turnpike at its side, leading more directly, comfortably and expeditiously to the same point. If in handling my subject I have claimed too much for my own side, or infringed unwarrantably upon the rights of others, demonstration of the fact

will be the signal for immediate concession and apology. I have desired to write as I endeavored to act, with the impartiality of a man, neither disposed to conciliate nor afraid of offending any party, but in search of the truth — the whole truth, and nothing but the truth. Those who can look down from that disinterested position which all should occupy, upon the squabbles of medical men and medical schools, must be disgusted with the bitterness of spirit so frequently engendered by a difference of opinion. It is like religious intolerance, which damns the poor brother who reads the same Bible by the torch of a different interpretation. This narrowness of thought we should eschew as the spirit of evil, and aspire to adopt in all things the beautiful and catholic motto of the British Journal of Homœopathy, echoed from one of the Fathers of the Church: "IN CERTIS UNITAS, IN DUBIIS LIBERTAS, IN OMNIBUS CARITAS."

CINCINNATI, January, 1852.

THE

SCIENTIFIC BASIS OF HOMŒOPATHY.

REASONS FOR THE INVESTIGATION OF HOMŒOPATHY.

After the great revolutions which permitted the seeds of civil and religious liberty to germinate in Europe, the mind of man began to display its innate activities as it had never been enabled to do before. Discontented with the feeble range of his unaided senses, the student of nature applied himself, with extraordinary success, to the construction of instruments, to enlarge the field, and render easy the acquisition of knowledge. The art of printing permitted the great principle of associated labor to be brought more advantageously to bear upon the investigation of truth. Every branch of physical inquiry received an impulse which has never been intermitted. Useful improvements, splendid discoveries, and the absolute creation of new arts and sciences, have not been the only fruits of this inspiriting progress. Errors have been corrected, prejudices uprooted, and the general mind, to a great degree, emancipated from that dogmatic slavery which is worse than the tyranny of rulers. The soil, to speak metaphorically, has been cleared of many of its rank weeds, to make way for the seeds of truth. These had been occasionally sown before, by brave and

superior spirits, but their evil neighbors sprung up in foul luxuriance, and choked them. Ancient philosophers, amid the very shrines of idolatry, taught to their select pupils the unity and invisibility of God. The great idea of human equality, still only partially recognized, is older than the Spartan republic. And the fundamental principle of all Medical Science is found enunciated in a book "on the relations of medicine to man"—attributed to Hippocrates, and at any rate the product of a remote period. Διὰ τὰ ὅμοια νοῦσοι γίνεται, καὶ διὰ τὰ ὅμοια προσφερόμενα ἐκ νοσούντων ὑγιαίνονται — sick people are cured by remedies which produce analogous diseases.

Not only are ideas, and facts, and things associated by certain affinities—but the discoveries and advances of a particular epoch bear to each other a definite resemblance. Truth is never isolated. Horne Tooke said, that from a single thought all philosophy might be deduced. Herschel supposed, that from bare elementary conceptions of time and space, all mathematics might be constructed. The various departments of human knowledge stand to each other in strict and beautiful correlation. Homœopathy is prominent in the midst of a noble group of congeners. Its fundamental axioms—the curing of disease by drugs which produce a similar pathological condition, and the efficacy of infinitesimal portions of medicine—are directly antagonistic to the fallible experience of mankind. No system ever stood in such need of that whole cycle of sciences from which general principles are evolved, and by which alone experience can be corrected and rendered available to art. And no system could ever exhibit such an intimate affinity with that cycle of sciences.

The struggle of the medical mind is for a rational union of theory and fact—of principles and phenomena. The constructors of Homœopathic science have endeavored to pursue the Baconian process of induction. The foundation stones of the superstructure are facts—thoroughly substantiated, carefully collected, and systematically arranged. These have been met only by theoretical objections, inadmissable in a question solvable only by experiment, or by the cheaper and more usual method of impugning our motives and impeaching our testimony. On our facts many theories have been reared, differing with the capacity of the mind surveying, and with the point of view from which the subject was surveyed. If the facts be *facts* indeed, there is a discoverable theory to harmonize and explain them, as certainly as there is a soul to animate the body. All theories are provisional—they are but relatively or approximately true. But we may safely pronounce that theory the most scientific, which has the strongest and broadest basis of experience, and the most extensive correlation with the known laws and phenomena of nature. For such a theory I have sought, and I leave it to the medical profession, as the only competent tribunal, to determine whether my returning vessel is laden with gold, or only with the sand that glitters like gold.

Homœopathy has a three-fold practical basis—the phenomena of disease, the phenomena of drugs, and the correlation of all Forces, Vital and Physical. Upon these it would rest immutably, were speculation a thing impossible to the human mind. Nothing is more common than to hear the system of Hahnemann denounced

as a visionary hypothesis and a vagary of the imagination. There are two species of imagination, the poetic and the scientific. The one impels men to seek for philosopher's stones, elixirs of life, and fountains of youth. The other is that sublime faculty which not only collects facts, but so arranges and classifies them as to deduce from their synthesis the laws of matter. To the former class of minds belong Plato, Paracelsus, Fourier, Shelley, and the like; to the latter, such men as Newton, La Place, Faraday, and Hahnemann.

In a *practical* point of view, the New School has greatly the advantage of the Old. Nothwithstanding all the disclaimers of the schools and journals, Allopathy is thoroughly tainted with false or questionable theories, so that her history is the history of fundamental error and temporary systems. Three or more physicians may treat the same disease by three or more different methods, and as there can be but one series of facts, the difference of treatment is only referable to difference of theory. Such a thing could not possibly happen under Homœopathic administration. The law of nature, which is our guide, insures great similarity, and a uniform principle of treatment. Not that Homœopathists do not theorize, for that is the natural tendency and necessity of the human mind. But a change of theory—the substitution of a better for a worse—does not involve a change of practice, as in the Old School. In this, Homœopathy bears an analogy to the Physical Sciences. The student of electricity may adopt the theory of Franklin, or that of Dufay, the views of Davy, or those of Faraday, but the facts and applications of electricty are the same. Whether he believes

light to be a corpuscular substance, or an ethereal undulation, the optician constructs his instruments in accordance with its ascertained laws of radiation, reflection, and refraction. Whatever theory of Magnetism prevails in the philosophical circle, the mariner never trusts in vain to the motion of his needle. Any new Abercrombie, Rush, Hall, Thompson, or Broussais, may modify the whole scope of Allopathic practice. The advocates of Homœopathy co-operate for one purpose, and in one direction—and Hydropathy is a legitimate ally, mainly on account of the simplicity and universality of its principles.

It is the tendency of this age to raise to its natural dignity the study of the infinitesimal. The grosser features of nature are no longer sufficient to sate the curiosity of the human mind. Schleiden, the great botanist, aptly and truthfully observes—"It indicates a most barbarous age, or a very low state of refinement, when the value of a thing is measured by great and small—a standard, indeed, which finds no application in all that we know most essential and valuable. Physical magnitude imposes only on our sensuous nature; cultivated man seeks to know the object of his contemplation perfectly, in all its relations, and then only from the perfect knowledge does he permit himself to judge as to the essential and the non-essential. Very frequently, this leads him to declare that most significant, which has least dimensions." Every thing has been subjected to minute analysis—space and time even have not escaped. By the aid of the sphærometer, (an instrument which substitutes the sense of touch for that of sight in the measurement of minute objects,) an inch

may be readily subdivided into 20,000 perceptible parts. Contrivances have been made to enable the mind to appreciate distinctly the interval of the $\frac{1}{1000}$th of a single second. The precise length and number of the ethereal undulations which cause the different colors, have been estimated and stated in figures, which almost stupify the human imagination. Electrometers have been recently invented, which not only render sensible, but subject to precise measurement and subdivisions, degrees of force infinitely too feeble to affect the nicest balance of the usual construction. Scales have been made which turn with the thousandth part of a grain. There is a thermo-electric instrument so delicate that it measures accurately the comparative warmth, or animal heat of minute insects.

But the use of the microscope, particularly, has poured a flood of light over every department of molecular philosophy. We have thereby passed from the threshold toward the penetralia of the temple of nature. We have discovered animated beings so minute, that a million of them congregated together would not exceed in bulk the head of a pin, and yet each of these creatures is supplied with distinct and intricate organs. The axis-cylinder of the nerves, which is the delicate conducting medium of the Nerve Force, is sometimes only $\frac{1}{1000}$th of an inch in diameter. Dr. Wollaston manufactured a wire of platinum so attenuated that 30,000 of them in juxtaposition could only have occupied a linear inch. Now there is every physiological reason for believing that Dr. Wollaston's platinum wire touching the axis-cylinder of a nerve in a living animal, would produce muscular contraction, depraved

secretion, or any other phenomena indicative of disturbance in the nervous system. A great and imaginative writer says, that, "in every material object, there is a punctum saliens so small, that the point of a pin covers it, as with a sky." But after all our astonishing success, can we flatter ourselves that we have reached the *ultima thule* of discovery? Let the philosophic Herschel answer: "Microscopes have been constructed which magnify more than a thousand times in linear dimensions, so that the smallest visible grain of sand may be enlarged to the appearance of one a thousand million times more bulky; yet the only impression we receive by viewing it through such a magnifier is, that it reminds us of some vast fragment of a rock, while the intimate structure on which depends its color, its hardness, and its chemical properties, remains still concealed. We do not seem to have made even an approach to a closer analysis of it by any such scrutiny."

Our effort to reach the ultimate forms, and to discover the ultimate forces of nature, is like the child's pursuit of the rainbow which continually recedes before him. One thing, however, we have certainly discovered—that those forms, forces, and the distances at which they act, are all infinitesimal. This sublime truth should inculcate a more respectful and candid consideration of the kindred doctrine of the efficacy of Homœopathic attenuations. Nothing is more generally acknowledged by the cultivators of natural science, than that the external and obvious phenomena of nature, are only the aggregates or last results of vast series of molecular actions and infinitesimal motions.

This great fact, the basis of Homœopathy, is scarcely recognized in Allopathic Physiology, Pathology, or Therapeutics.

Our period of the world has abounded in those observations and discoveries, which teach us to distrust our preconceived opinions to question the evidences of our senses, and on all occasions duly to consider the limited nature of our own faculties. Every branch of science is so full of such examples that their mere recapitulation would occupy pages. Whoever will study Dumas' Theory of Substitution, the facts upon which it is founded, and the sublime generalizations to which it leads, and whoever will trace the wonderful and numerous features of identity in all the Imponderable Agents, will stand astonished, both at our past ignorance, and at the prospect of our future discovery. Who would suppose that the various parts of a plant—the stem, the petal, the stamen, the pistil, the fruit, the seed—were all modifications of a single elementary form—the leaf? Who could believe, at a superficial glance, that the cranial bones were vertebræ? And yet, although at first ridiculed as obscure and fantastical, no facts in natural science are better established than these. Reviewing Owen and Maclise on the Archetype Skeleton, a writer in the British and Foreign Med. Chir. Review, July, 1848, throws out some suggestions very valuable in this connection. "It is impossible to conceive of any process of mental training better adapted to overcome that *stupor et incompetentia sensuum*, which Bacon condemns, than the study of the typical formation of the skeleton in the animal series. Such an inquiry demands, as the first condition, the rigid

subordination of the senses; form, size, position, the most obvious circumstance that appeal to the eye, here have no signification. In determining what are homologous parts, it is even necessary, in some cases, to reject the evidence of function, for organs may be homologues of each other, and yet have very different offices."

Only the most comprehensive view, which while not neglecting the field of external appearance, yet soars far above it, can hope to penetrate into the more valuable secrets of nature. Such a view has discovered that the properties of matter are dependant, not upon the matter itself, but upon the specific arrangement of its molecules. Such a view has revealed to us, that what we have hitherto called the Forces of nature are nothing but undulating motions of matter itself. These facts, and only those phenomena of Isomorphism, Catalysis, Electro-Magnetism, Homology, Neurology, and Mesmerism, to which all will concede, look more to the uninitiated eye like the phantoms of imagination than the acquisitions of science. It is almost incredible, that the analogical doctrines of Homœopathy, the only true scientific phasis which medicine has ever assumed, should be passed without notice, or assailed with contempt. When we see what anomalies have been made to disappear, what incongruities have been reconciled, what apparent impossibilities have taken the attitude of positive facts, how should the spirit of skepticism stand rebuked on the shore of the unexplored ocean of truth before us!

There are many *a priori* considerations which should recommend Homœopathy to the favor of the medical

inquirer. The extreme care and nicety employed in the collection, preparation, and putting up of the medicines should excite the admiration of the practical pharmaceutist. The abandonment of all intermixtures, congruous or incongruous, and the great facility of administration, certainly must be recognized as advantages by the practitioner. The experimental method of ascertaining the action of drugs, and the thorough examination of all the causes and symptoms of disease, both internal and external, should at least redeem it from ridicule in the eye of the philosophical physician. And finally, the promise of a new method or rather a natural law, based upon experiment alone and independent of all speculation, which will substitute order for anarchy and uniformity for great and sometimes ridiculous diversity, should excite the attention of all acquainted with the history, or interested in the results of scientific discovery.

Six years ago, Dr. John Forbes, one of the most distinguished physicians of Great Britain, and at that time editor of the British and Foreign Medical Review, in an article which on account of its liberality and candor, should be popular with the mass of the profession, thus expressed himself in relation to Homœopathy: "No doctrine, however ingenious, not based on positive demonstrable facts, will any more be regarded but as a piece of poetical speculation, which may indeed amuse the fancy, but can never influence the conduct of scientific men, much less of practical physicians. But Homœopathy comes before us in a much more imposing aspect, and claims our attention on grounds which can not be gainsayed. It presents itself

as a new art of medicine, as a mode of practice utterly at variance with that long established in the world; and claims the notice of mankind on the irresistible ground of its superior power of curing diseases and preserving human life. And it comes before us now, not in the garb of a suppliant, unknown and helpless; but as a conqueror, powerful, famous, and triumphant. The disciples of Hahnemann are spread over the whole civilized world. There is not a town of any considerable size in Germany, France, Italy, England, or America, that does not boast of possessing one or more Homœopathic physicians, not a few of whom are men of high respectability and learning; many of them in large practice, and patronized especially by persons of high rank. New books on Homœopathy issue in abundance from the press; and journals, exclusively devoted to its cause, are printed and widely circulated in Europe and America. Numerous hospitals and dispensaries for the treatment of the poor, on the new system, have been established, many of which publish reports blazoning its successes, not merely in warm phrases, but in the hard words, and harder figures of statistical tables."

Since these concessions were made, the progress of Homœopathy can only be compared to that of our Western cities. In that short space of time, the number of Hahnemann's disciples has been trebled or quadrupled. Besides a number of monthlies, there are two Quarterly Homœopathic Journals in our own language, which will vie, in scientific value and literary execution, with any periodicals of the day. The sale of Homœopathic books and medicines during the past

year, has been hitherto unprecedented. Schools are springing up, in which all the branches of medical education are taught. The one in Philadelphia, the very emporium of American Medicine, and therefore the fittest arena for Homœopathic triumphs, is in a flourishing condition, with constantly increasing classes and a faculty of acknowledged professional ability, and the most honorable standing. But in exact proportion to the progress of the New School has the spirit of concession departed from its opponents. Hahnemann, once acknowledged to have been a rare combination of genius and learning, is now the prince of quacks, if not of madmen, and all his disciples professional and lay, are classed in the same category. The triumphs of the system are no longer admitted and recorded by a generous opposition. If one went to Allopathic physicians and journals for information, he would learn that Homœopathy had been weighed in an impartial balance and found wanting, that it had been thoroughly exposed as a Mammoth imposture, and driven entirely from the pale of respectable society. Editors and professors not only deceive themselves, but labor assiduously to communicate their mental obscuration to others. They are like the watchmen on the walls of Zion, who cry, "peace! peace!" when the enemy are even within the gates.

There are many physicians who honestly believe that Homœopathy has been fairly tested, and unequivocally condemned by some of the greatest medical authorities in Europe. This has been retailed from mouth to mouth, and from journal to journal, until the impression is so general, that those who have enough natural

spirit of independence to inquire for themselves, are lulled into profound indifference by the idea, that a task, troublesome and difficult, has been ably and satisfactorily executed by others. It has been stated that Andral, the greatest clinical physician in Paris, made numerous experiments at his own hospital, and declared the medicine wholly inert. Broussais sensibly remarked, "I hold it as a principle always to suspect the experience of a man whose mind is pre-occupied." This sentiment, however true, would have been kept charitably in the back ground of our minds, had Andral himself gone through that thorough preliminary study, and exhibited that candid spirit of open investigation, which we expect from men in pursuit of physical truth. But Dr. Curie, whom Allopathists state to be "an enlightened man, and perfectly sincere in his convictions," was told by Andral himself, a short time before commencing his experiments, that he (Andral) knew very little about the practice involved in the new doctrines. Experiments made by a prejudiced man, and one only superficially acquainted with a system of vast scope, should certainly be received with great caution. Those better acquainted with the practical phases of Homœopathy than he, discovered from his own statements that he had made a wrong application of every medicine.

This mockery of examination has been made in a similar manner throughout the country by private physicians, by many of them no doubt in perfect sincerity, and as might have been anticipated, with a similar result. After a whole year of just such superficial investigation, I pronounced sentence against Homœ-

opathy, which was only reversed after six months more of *real* study and *real* experiment. An unforeseen argument with an eminent Homœopathist happily stimulated me to push my inquiries. But he who ventures to pronounce an opinion on the subject of Homœopathy, before he has spent an entire year in the earnest study of the science of Pathogenesis, and before he has tested the medicines practically, both on himself and others, many times and in many different cases, does a great injustice to Homœopathy, and a still greater injustice to his own professional character.

But what if Andral did, after conducting his trials in the best spirit and manner, and with all the knowledge of the subject acquirable at the time, come to his unfavorable decision? Does that prove that an investigation instituted at this time would not be attended with different results? The first committee appointed by the French Academy, in 1784, to examine the pretensions of Mesmerism, with the great Franklin in the number, made a most unfavorable report. A second committee called for in 1825, by the urgent and increasing claims of the subject, and which extended its thorough investigation over a period of six years, gave a far different account of the matter, and put the new science on its proper basis. Indeed a Daniel has come recently to judgment for the benefit of Homœopathy, and M. Tessier—in the same city, and if I am not mistaken, in a ward of the same hospital—after two years experience, emphatically reverses the unrighteous decision of Andral. He has given an account of his conversion, which was based upon his successful Homœopathic treatment of pneumonia and cholera, two of the most

violent diseases to which the human frame is liable. With regard to this fact, and indeed to all the public tests and triumphs of Homœopathy in Vienna, Leipsic, Naples, and other places, the Allopathic press is remarkably silent. One would suppose that its spyglass never scans the medical horizon. It reminds me of Nelson at the battle of the Baltic, looking with his *blind eye*, because he did not choose to see that the admiral had struck his colors.

No amount, however, of conversational or editorial rhetoric can convince me, or any other tyro in Homœopathy, that our system has been fairly tested by the Allopathic profession, when that profession displays its ignorance in almost every allusion to the subject. I wish to make this a strong reason for a most thorough investigation of Homœopathy. I take it for granted that every rational man will gladly be corrected of his errors, and that every generous one will eagerly make atonement for unintentional injustice he has committed—when the reality of such injustice has been demonstrated. None but little minds take umbrage at the exposure of their deficiencies, and with such I do not care to hazard the fate of an appeal.

Notwithstanding the numerous and repeated disclaimers of the Homœopathic school, Hahnemannism is still the principal target for Allopathic ridicule or rage. Much time and labor have been spent by enthusiastic disciples in defending, not only the principles, but even the personal character of the great reformer. Now, as far as the merits of Homœopathy are concerned, it matters not whether Hahnemann was as arrant a quack as the Indian medicine-man, or a witch-

doctor, or, as I believe him to have been, a sincere, capable and misrepresented man. And it astonishes me, to see men, who profess to have been trained in the positive school of science, waging war against the dim shadows of theory, or declaiming grandiloquently against what they are pleased to term quackery, instead of meeting the subject on its true grounds, and abiding manfully by the logical issue.

Dr. Hering, one of the oldest and most distinguished Homœopathists in the United States, thus expressed himself in 1836: "For myself, I am generally considered a disciple of Hahnemann, and I do indeed declare, that I am one among the most enthusiastic in doing homage to his greatness; but nevertheless, I declare also, that since my first acquaintance with Homœopathy (in 1821) down to the present day, I have never yet accepted a single theory in the Organon as there promulgated. I feel no aversion to acknowledge this, even to the venerable sage himself. It is the genuine Hahnemannean spirit to disregard all theories, even those of one's own fabrication, when they are in opposition to the results of pure experience. All theories and hypotheses have no weight whatever, only so far as they lead to new experiments and afford a better survey of the results of those already made."

Dr. Hering is by no means isolated in his opinions. Hahnemann's *psoric* theory of chronic diseases has particularly excited the mirthfulness of our antagonists, and indeed some Homœopathists have abandoned it altogether. But when it is recollected that by psora, Hahnemann does mean the itch alone, but all the infinite varieties of cutaneous eruptions, the theory

becomes more plausible, and is at least left open for amiable discussion. But I propose to go further than any Homœopathist, I believe, has done before me, and call in question what is considered the fundamental theory of Homœopathy. Hahnemann assumed, as the rationale of his cures, the existence of a law—substantially based on experience, and therefore independent of all theoretical explantion, that of two similar actions developed in the same part, the stronger destroys the weaker. With various but still unessential modifications, this idea has been repeated by most of the Homœopathic writers. To the force of all the objections ever adduced against this supposed law I cordially assent. Nevertheless, it is an appearance as strong and as plausible as that which would persuade our senses of the motion of the sun, or the littleness of the stars. Behind this appearance there is a beautiful natural law, intimately correlated with all the known laws of matter, which gives a consistent and philosophical explanation of all the phenomena. I confess that the production of even an infinitesimal artificial disease in a suffering organ, can only aggravate by so much the existing condition, and has no curative power whatever. And yet I contend that Homœopathic attenuations, used according to the axiom *similia similibus curantur*, and in doses so regulated as to produce *no* aggravation, are more efficacious in the arrest of disease than any other known method of medication. Those who are curious to know how I would explain such a seeming anomaly, I invite to accompany my train of thought candidly and carefully throughout the following essays.

There is one most preposterous charge against Homœopathy, the establishment of which would entirely nullify all its claims to being a scientific system. It is said that we rely entirely upon the *external* symptoms of disease, so that in our opinion, the study of Etiology and Pathological Anatomy is a vain dream. This is given by Professor Bartlett, in his Philosophy of Medical Science, as a prominent objection. From the tenor of Prof. Bartlett's remarks on Homœopathy, I strongly suspect that his whole knowledge of the subject, at the time he wrote, had been drawn from Hahnemann's Organon. How this erroneous impression ever originated, I can not imagine; unless in a misinterpretation of Hahnemann's idea, that we know and can know nothing of disease in its essential nature, and only see its material manifestation, or, as we may say, its incarnation. Acknowledge this to be true, and how does it show that there is a single fact, relative to health or disease, which is not as useful to the New as to the Old School physician? The manifestation of the disease, is the entire pathological condition of the patient. A vomica in the lungs, an adhesion of the pleura, an ossific deposit in an artery, an effusion of serum into the pericardium, and all other anatomical lesions, are symptoms of disease. What is the internal of man but a continuation and complicated involution of the external surface? Is not an ulcer in the duodenum, or trachea, as much indicative of disease as one upon the skin? And as our vision does not reach these organs, must we not resort scientifically to every method, rational or instrumental, of discovering their lesions? Latent pneumonia may pass undetected by all external observation,

but when auscultation and percussion reveal it, we treat it by substances which would have produced in the healthy man intense pulmonary congestion.

We have based our use of tartar emetic in some forms of small pox, which has been remarkably successful, not only on its internal action, but on its definite anatomical lesion. Let me refer to Pereira's great work on Materia Medica: "It causes an eruption of painful pustules, resembling those of variola or ecthyma. The smaller ones are semi-globular; the larger ones when at their hight are flattened, are surrounded with an inflammatory border, contain a pseudo-membranous deposit and some purulent serum, and have a central dark point. When they have attained their greatest magnitude, the central brown spots become larger and darker, and in a few days the desiccation takes place, and the crusts are thrown off. I am acquainted with no agent which produces an eruption precisely similar. The facility with which this eruption is produced, varies considerably in different individuals, and in the same individual at different times. A similar pustular eruption has been met with in the mouth, œsophagus, and smaller intestines, from the internal use of tartar emetic." It will be in vain contended that this is a resemblance and not an identity. This resemblance is just what we seek—for I am prepared to show that while an identity aggravates, a similarity cures.

On what do we predicate the application of Bromine to croup, which we have found so vastly superior to bleeding, blistering, calomel, or tartar emetic? Upon the pathological anatomy of that drug, as shown by experiments upon pigeons and doves. It is well known

that the substances of the Chlorine group are irrespirable; and Turner states, that a single drop of Bromine placed only upon the beak of a bird proves fatal. The Bromine was, therefore, used in exceedingly minute dose, so as to pass into the stomach without producing spasm of the glottis. Noack and Trinks report upon dissection—"severe inflammation of the larynx and trachea, with exudation of plastic lymph, almost blocking up the tubes." It was for a long time supposed that arsenic produced inflammation of the stomach by its local action, but it has been found to excite the same gastritis whether injected into the blood or applied to an external wound. Indeed, Sir B. Brodie says, that its gastritic action in the latter case is more violent and immediate than when applied to the stomach itself. Just so the specific action of Bromine is to produce an artificial croup. These are mere brief examples, of which a vast number might be given. So that instead of discarding the Pathological Anatomy of natural diseases, we add to it and compare with it, the hitherto unexplored Pathological Anatomy of drug diseases. After such explicit statements, I trust that the unfounded objection will no more recur in the pages of honest opponents, and only for the opinion of such do I care.

Another more palpable but equally prevailing misrepresentation of Homœopathy, is that which represents it as relying exclusively on its own resources, and contemning the accumulated experience of ages. Nothing but personal observation could ever have convinced me that this idea had been imposed for truth upon a single professional man. What is this "accumulated experi-

ence of ages," which seems to rank in authority next to the Bible, and which we have the rashness and vanity to despise? The wonderful and fixed facts of General, Special, Surgical and Pathological Anatomy? The discoveries and speculations of Physiology? The immutable truths of Chemistry and the almost equally certain anatomical and physiological features of Botany? Do we disregard or abandon the principles and practice of those great sciences—Obstetrics and Surgery? Do we despise the beautiful and accurate descriptions of disease which we find in a thousand volumes of British, Continental and American Medicine? No!—we answer most emphatically, no! Every *fact* ever discovered in the physical universe is of as much interest and more use to the Homœopathist than to his pseudo-superior opponent.

But I would remind him that all these treasures, to which we lay an equal claim, have been accumulated within a very brief period. Chemistry has just emerged from the mysterious shadows of Alchemy. The knowledge of the circulation of the blood is only two centuries old, and Physiology had no proper existence before it obtained a correct anatomical basis. It has not been very long since the stumps of amputated limbs were seared with hot irons and boiling tar poured into wounds. Obstetrics has just been raised from the most degrading position to fellowship with her sisters of the Medical Art. For all but the most recent phasis of the Materia Medica, the man of science must blush. But a few centuries ago the articles in the following disgusting catalogue were considered of great remedial value—the left foot of a tortoise, the urine of a lizard,

the dung of an elephant, the liver of a mole, the excrements of rats beaten to powder, blood drawn from under the wing of a white pigeon, the moss from a dead man's skull, and the ashes of a burnt witch. Sometimes a hundred or a hundred and fifty of these substances were compounded together into one terrific dose by the wiseacres of the profession, from whom the physicians of our enlightened day are so anxious to claim a legitimate descent. From such "accumulated experience" we pray to be delivered. Every thing valuable in science, and especially in medical science, (like American aristocracy,) has a very short pedigree.

But there is one phasis of Allopathic experience constituting probably one-eighth of what purports to be the science of medicine—and three-fourths of what the practitioner generally recollects—to which we make our entire dissent. I mean the empirical method of ascertaining the properties of drugs by experimenting upon sick people with them. This is the evil genius of medicine. It had its origin in the ignorance and necessities of a barbarous era, and to its unhappy continuance through a long series of ages does Allopathy owe its boast of antiquity. We contend that such experience is so uncertain and fallible that it is not at all trustworthy in the treatment of disease. It is the grossest empiricism imaginable. One irrefutable proof of it, is the great diversity and constant contradiction of this experience. To this are to be traced all the variances of theory and practice, which have called forth the satirical definition of medicine as "the art of amusing the patient while nature cures the disease." We contend on the contrary, that only by experiment-

ing upon healthy persons, can we get at the true properties of a drug, mark its definite individuality, learn where to class it, and know what to do with it. The unanimity of Homœopathic experiments confirms the obvious rationality of the method.

We accept then gladly, all the facts of medicine which can be logically proven to be facts. We reject the clinical experience of Allopathy, because no relation between causes and effects is therein established; because in studying it we are conscious that we are committing to memory the inferences and opinions of fallible men, and not the facts of nature. Upon the real character of this medical experience, Abercrombie has a choice paragraph, in his Inquiries concerning the Intellectual Powers, page 299. "When, in the practice of medicine, we apply to new cases the knowledge acquired from others which we believe to have been of the same nature, the difficulties are so great, that it is doubtful whether in any case we can properly be said to act upon experience, as we do in other departments of science. For we have not the means of determining with certainty, that the condition of the disease, the habits of the patient, and all the circumstances which enter into the character of the affection, are in any two cases precisely the same, and if they differ in any one particular, we can not be said to act from experience, but from analogy. The difficulties and sources of uncertainties which meet us at every stage of such investigations are, in fact, so great and numerous, that those who have had the most extensive opportunities of observation will be the first to acknowledge that our pretended experience must, in general, sink into analogy, and even our analogy too often into conjecture."

Far be it from me to insinuate that the experiences, the inferences, and the opinions of Homœopathic practitioners are a whit less fallible than those of the Allopathic school. Their practical superiority lies in the more scientific plan of their clinical procedure. They do not try to recollect what this, that, or the other man found useful in a similar case. Their intellect is not hampered, and their practice misdirected by pathological speculations which are the bane of all other systems. They note the facts of the case—and seek for a drug which will produce similar symptoms in a healthy man. The first series of facts—those of the disease—they acquire by observation; the second series—those of the drug—by experiment. In this last is a great deficiency, a breach in the Homœopathic rampart which all its true friends must labor to fill. The science of drug-pathogonesis is imperfect, although much more complete and imposing than Allopathic writers seem to be aware of. Empirical trials on sick men are worthless. Although a hundred physicians told me that colocynth cures a painful diarrhea, I have no more scientific reason for using colocynth in a similar case, than if only a hundred old women had told me the same thing. But if several competent witnesses assure me that colocynth *produces* a painful diarrhea, I have a fact worth remembering and worth using. And then when I find it to cure, I deduce from the sufficient number of such cures, not a pathological speculation, not an inference, but a law of nature—"like cures like."

I must define, however, the sense in which I call this principle—"similia similibus curantur"—a law of nature. If I were called upon simply for my belief—and be it recollected, that "faith is the evidence of

things not seen"—I would say that there is a positive law of nature, by which a remedy bearing a certain definite relationship to a given pathological condition, will always remove it. But if I am asked for a truthful deduction from the facts as they now stand, I answer, that the law is an empirical one—indeed a mere principle assumed to explain many otherwise inexplicable phenomena. The laws of gravitation, atmospheric pressure, atomic combination, composition and resolution of forces, etc., are laws of nature, because there are no exceptions to their operation. Homœopathic failures show conclusively, that we can not make our principle work infallibly, as a natural law necessarily does—hence I call it an empirical law—but have strong hopes that as we free it from incumbrances, it will break out in a clear and positive light. Homœopathic practice now, is like the first rude efforts of steamboating, before the scientific principles of that wonderful art were fully comprehended. But even that was a vast improvement upon the flatboat and batteau. Our empirical law is a better, safer, and more scientific therapeutical guide, than any which exists in Allopathic medicine.

If the candid reader is disposed to look the ignorance and injustice of a profession, which should be enlightened, full in the face, so that he may contribute his quota to its amendment, I refer him to two brief communications in the London Lancet for October, 1851. One is headed "The humbug Homœopathy." It gives an account of a child swallowing a number of the pellets of several different articles, all at once, with perfect impunity. The writer seemed to have sup-

posed, that in order to establish the pretensions of Homœopathy, some deadly effect should have followed, And when no effect of any kind did follow, he thought himself justified in lifting his hands and eyes to heaven in righteous indignation, that so much sugar of milk should be palmed upon the world as medicinal. This is an old trick, and a very common one, for I have heard of it from many sources. An Allopathist, on his rounds, meets with a quondam patient, who has been deluded into putting himself under Homœopathic care. He questions the truant, who trustingly and inquiringly shows him the little vial of medicated pellets which he is using. The doctor takes them, look at them like a magpie peeping cunningly into a marrow-bone, smells them, pours them all out into his hand, and swallows them at a gulp. The layman stares at him in apprehension, like the people of the island upon St. Paul, when he was snake-bitten. As he could not commit the mistake of the islanders and suppose the doctor was a god—he takes what appears to him the other horn of the dilemma, and is convinced of the perfect imposture of the new system. By this expressive pantomime, the stray sheep is brought back to the fold, and the doctor congratulates himself on his irresistible powers of argument. But, alas! there is no argument in the case, for one man has only riveted his own misconception upon the mind of another.

I have never tried the experiment, but I think it highly probable that the ninety-six articles in my case, might be swallowed at once, with entire impunity. And yet, a single one of those articles taken in repeated doses for a suitable time, will produce, on the

healthy man, its peculiar pathogenetic effects. But instead of testing this fact upon his own person, and seeking some physiological law for its explanation, the physician rests contented with the vulgar experiment above detailed, and panders mediately and immediately to popular prejudices. I shall hereafter give a reason why a medicine in a certain preparation, may be promptly curative, and produce no pathogenetic, and, indeed, no perceptible effect whatever. Lenient construction and an opportunity of explanation are the universal privileges of man. But if the style and spirit of a composition give any insight into mental character, the author of the article in question would not stay for this or any other explanation, but would run like a gossip to his nearest non-professional neighbor, and tell him that a Homœopathist had at last promulgated his own atrocity, by confessing that his case of medicine, minus the bottles, corks, labels, and leather, might be swallowed at a dose, without injury!

The other communication to which the London Lancet has given its seal of sanction, purports to give an account of the method by which Homœopathists reduce dislocations. Dr. Epps of London, an eminent Homœopathic physician, was thrown, it appears, from his horse upon the curb stone, and had his shoulder dislocated. When picked up by an Allopathic surgeon, he first insisted that some Tincture of Arnica should be applied to the injured part. The surgeon says that *he* reduced the luxation *secundem artem*—no doubt commiserating the folly as well as the misfortune of Dr. Epps. The impression designed to be left upon

the reader, is, that Dr. Epps expected the head of the bone to be replaced, without any resort to surgical measures, by the use of a Homœopathic medicine. Neither rhetoric nor logic is needed to expose the barefaced meanness of the statement. And yet these articles are found in the London Lancet, the leading medical Monthly of Great Britain, which is sent to all parts of the civilized world, for the enlightenment of the profession!

Every person who has ever tried it, knows the remarkable value of Arnica both to prevent and alleviate the inflammation arising from bruises, sprains, lacerations, and other mechanical injuries. But I will bring Mr. Liston, one of the greatest English surgeons of modern times, to bear witness to the efficacy, not only of Arnica, but of other Homœopathic remedies. The gentlemanly liberality and candor of this distinguished man might be held up to his professional brethren, particularly some of his brother surgeons, as a becoming model. I quote from Dr. Quin's letter to the British Journal of Homœopathy.

"Encouraged by the success which had attended his administration of acenite and belladonna in erysipelas, Mr. Liston requested me to give him a few notes of other diseases treated successfully by Homœopathy, with the names of the medicines usually prescribed by me for their cure. This I immediately complied with. He subsequently informed me that he had employed the following medicines with great success: *Arnica montana* internally and externally in severe contusions, lacerations, and incised wounds; *rhus toxicodendron* in sprains, luxations, and swollen and painful joints;

nux vomica in irritation of the bladder, obstinate constipation, and in some cases of partial paralysis: *bryonia alba* in rheumatism, and in arthritic pains of the joints; *chamomilla* in diarrhea, and as a palliative for tooth-ache; *pulsatilla* in retarded and suppressed catamenia; *mercurius solubilis* alternated with *belladonna* in cynanche tonsillaris, and ulceration of the fauces; and a variety of other medicine, unnecessary for me to occupy your pages with, as their effects are familiar to every Homœopathic practitioner. Mr. Liston, however, was most struck with the action of aconite in subduing inflammation, and reducing vascular excitement, and he often expressed his regret to me that the power of aconite to abate vascular overaction, and supersede the necessity for abstraction of blood in many diseases, was not known to him earlier, because he was convinced that it would have prolonged the life of his father, whose death had been hastened, in his opinion, by ill-judged copious venesection."

But let us consider further some of the objections against Homœopathy as a system, which deter medical men from even investigating the subject. It is said to be a system of specifics, and therefore necessarily so unscientific as to deserve not even a passing notice from the profession. This depends entirely upon what is meant by specific. If it mean a drug or preparation which will infallibly cure a certain disease, Homœopathy recognizes the existence of no such article. The fabulous history of such agents is found only in the advertising columns of newspapers. Those nostrums are indeed the illegitimate children of Allopathy—the monstrous progeny of a base alliance between false pathological

theories and popular notions. Orthodox medicine labors in vain to exterminate the troublesome race its errors have engendered. Not until their death-blow comes from Homœopathy will the entire domain of disease be given up to positive science. But if by specific is meant an article which exerts a *definite* action on the healthy body, and is thereby able to fill a *definite* indication in a similar pathological condition, then I confess that Homœopathy has already collected four hundred such articles. Many gifted medical men have cherished a belief in the existence of such specifics. Dr. Rush expressed a hope that there was some flower blooming in our valleys which would ultimately rob pulmonary consumption of all its terrors. And Prof. Alison, of Edinburgh, bases much of his hope of the future progress of medicine on the discovery of specifics, which shall counteract the diseased actions to which our bodies are liable. That medicines have a definite action is thus expressed by Simon: "We know that causes choose their organs of manifestation with as decided and sometimes almost as exclusive a preference as governs the phenomena of inorganic chemical affinity. This we may make matter of experiment; if one introduce various noxious agents into the stream of circulating blood, all organs are equally exposed to their influence, but how differently are they affected? Inject opium and the brain suffers, arsenic and the stomach inflames, strychnia and the cord is acted on, cantharides and the kidneys are irritated, and all this so definitely, that the attraction evinced is equal to a chemical demonstration of the agent employed."

It has been the arduous and truly scientific labor of Homœopathy, to obtain precisely the actions of drugs and compare it with the similarly uniform actions of disease. The pathogenesis of drugs upon the healthy body, when it is free from all disturbing causes, is the only rational basis of therapeutics. There is just as much and no more similarity in the action of different drugs as there is in the phenomena of different diseases. A great many drugs, as well as a great many diseases, may concur in having a particular symptom—diarrhea for example. But yet every drug has its specific differences from all other drugs. So to a certain disease each of many medicines may be a *simile;* upon narrowing the circle we may have several articles each of which is a *similius* when compared with those left in the first group; and finally we may select from any number of articles a *similimum*. This selection requires a degree of physiological and pathological acumen, to which thorough professional education is the pre-requisite, and the exhibition of the article is followed by a recovery speedier and more thorough than would have resulted from the use of any of its congeners. There is no one thing in the whole creation exactly like another, so that each material substance maintains a specific position, and occupies a sphere that never can be occupied by any thing else.

I pity the superficial philosophy of the man who supposes that he has explained the cures of Homœopathy by proving the intercurrent play of the human imagination. Whilst he thinks he has driven the mystery to its last corner, where subterfuge is no longer possible, he has only let it escape from the dungeon of physical

analysis into the boundless atmosphere of metaphysics A great number of facts prove that imagination may produce diseases, an equal number shows that it may cure them. But there are causes and cures of disease entirely independent of imagination. A man who proves that imagination has cured a certain disease, has not proved that Homœopathy may not have cured the same disease a thousand times. The cures to which the finger of Homœopathy is constantly pointed are very insusceptible to cure by any mental agency. Pleurisy, pneumonia, cholera, dysentery, inflammation of the brain, erysipelas, are never left to imagination, or nature either, by Old School physicians. These occult potencies might or might not work for Allopathists; they always do work for Homœopathists!

But there is proof from three distinct sources, which should dissipate forever this puerile hypothesis. Homœopathists have repeatedly cured patients laboring under coma and apoplectic stupor, where there could have been no exercise of the mental faculties. Again, our treatment of infantile diseases has been eminently successful. Imagination here is obviously beyond the pale of probability. Thirdly—the diseases of the lower animals—horses, cows, dogs, sheep, etc.—have been treated with the greatest success upon the Homœopathic principle. A number of books on Veterinary Homœopathy have been published. Does any rational man suppose that there is no foundation whatever to these facts, accumulating now for fifty years in various and distant countries? Can such an immense superstructure be erected upon positively *nothing?* Can it be possible that so many thousands and hundreds of thousands of

people have been banded together to deceive themselves and each other. "*Judeus credat, non ego.*"

But I am not disposed to make light of the power of imagination. The time is approaching when the connection of mind and body, and their mutual reactions will belong, not only to the speculative province of moral philosophy, but to the higher and more abstruse department of Physiology. But I insist that those who believe in the curative power of imagination, most especially in Homœopathic patients, shall give us some more definite information as to the manner, rate and laws of its action. They are, no doubt, aware that we Homœopathists have a great partiality for precise, connected, well-established *facts*, and a very great contempt for theoretical generalities. Whenever the therapeutic power of imagination is placed upon a positive scientific footing, I shall hail its introduction into the Materia Medica, where it will probably occupy quite an important niche. I am anxious for Allopathists to avail themselves of the magic properties of this Homœopathic panacea. Better let a whimsical conceit out of the mental circulation than the life blood out of the body. Better excite healthy action by playing gently on the fancy, than by scraping dolefully on the intestinal strings. Better act upon the liver by some spiritual electricity than by the administration of calomel porridges.

Homœopathy, after a superficial trial, or, rather, no trial at all, has been classed with those impostures which find their auxiliaries in the vanity, credulity, superstition, or love of the marvelous inherent in human nature. This charge bears its refutation on its

face. No system of medicine ever presented such a bold, undisguised, and uncompromising front. It banishes imperatively from the sick chamber all the cherished and time-honored herbs, teas, liniments, and domestic notions. It demands as a preliminary requisite no interference with the proceedings of the physician, and implicit obedience to his regulations however obnoxious to the preconceived opinions of the party. In trivial cases people may try it from curiosity, but faith in its real curative power, I venture to say, has been, in every instance, reluctantly yielded to accumulated evidence. On first inspection, people are as incredulous of its efficacy as the Indian philosopher of the rotundity of the earth and central position of the sun. The imperceptible action of the medicines, and the recondite nature of their *methodus medendi*, give no hold whatever to the untutored imagination. The avenues of faith in the minds of the populace are through their senses. Tangible effects, vomiting, purging, sweating, pain, deep sleep, prompt physical changes, violent perturbations, indeed, are with them the *criteria* of the suitableness of the medicine and the skill of the attendant. In Homœopathy they see nothing but sugar globules and hygienic directions. They will not trust their lives to means apparently so inadequate to meet the exigencies of the case. These facts afford the reason why Homœopathy is comparatively limited to the more intelligent classes of society. Nothing but education enables man to disregard the veil of external appearance, and look for the hidden realities of nature.

But Allopathists have a reserved key, which is the the "Open Sesame" to every Homœopathic secret. It

has been found that by abandoning the use of drugs in large doses, the number of recoveries has been greatly augmented. To explain this, which must have seemed a very curious anamoly to the advocates of the heroic treatment, they have suggested the existence of a *curative force* in the human body—a *vis medicatrix naturæ*. That many diseases pass away spontaneously is obviously true—but that any new force is created, or a latent one excited to resist abnormal processes, is entirely hypothetical. A certain uniform and connected play of the functions is observed in health, which although partially impeded goes on as well as it can in disease. A ship has no innate living power of resisting a storm, but its parts may be so constructed and held together, that many storms can not destroy it. "Nature cures diseases" is too positive a formula for our present state of knowledge. "Most diseases do not kill" appears to be a more cautious and truthful statement.

In reading the usual accounts of the processes going on in wounds, fractures, etc., one would think some intelligent power had taken special notice of the damage, and delegated an eager and busy host of deputies to the part, like carpenters to the repair of an injured building. This leaves on the mind the erroneous impression, that there is at work during the process of recovery, some causative principle other than the usual operations of the economy. But the re-union of divided tissues is but a continuation of the common processes of nutrition, which create all those tissues and hold them in appropriate continuity. They moreover take place under disadvantages, and therefore the new tissues,

whether bones, ligament, or cutaneous cicatrix, are never as perfect and vitalized as the old ones had been. When a bullet which can not be extracted becomes encysted in the body, we say that nature has invested it with a fibro-cellular incrustation, to prevent it from irritating the surrounding parts. But although further irritation is no doubt prevented, the new tissue was not produced for that purpose, but was itself the result of inflammation, excited by the foreign body. The imaginative Greeks attributed the electrical excitation of amber to the presence of some invisible animal. The *vis medicatrix naturæ* of the present day is just such an invisible animal, invented to cloak our ignorance of the natural and physical laws, which regulate abnormal as well as normal states.

Repeated parallels have been drawn between Homœopathy and Allopathy, and I have still to learn when, where, or how, the new system suffered by the comparison. But in order to silence forever the *vis medicatrix* hypothesis, we are particularly anxious that an extensive comparison should be instituted between Homœopathy and nature. Such a one as would overcome all objections, and answer all cavils, has never been and probably never will be made. So many are the sources of error in the statistical method, that nothing short of a comparison between hundreds and even thousands of cases would be entitled to any consideration. But whilst faith in some kind of medication is so deeply rooted in the human mind, we cannot reasonably expect such a full and fair experiment to be made. We are not, however, without data, wherefrom to derive a tolerable conception of the natural history of disease. Oc-

casional, although brief trials of Expectant Medicine have been made in both public and private hospitals. And a great number of cases are recorded in medical literature, in which, for various reasons, there was either no treatment, or one evidently inert. From these sources, and by the aid of recent Physiology, Etiology, and Pathology, we get some idea of the course disease generally pursues, when uninterupted. With this series of phenomena, Homœopathists, by a similar course of education and observation, are as well acquainted as their opponents, and moreover as little likely to mistake an absolute nullity for a curative agency. They unanimously declare, that the recoveries under Homœopathic treatment are more frequent, speedy, certain, and perfect, as a general rule, than they have seen, heard, read, or can conceive them to have been, under the expectant treatment. Allopathists have no counter testimony to bring against this, because they have never thoroughly and practically tested the system. And no matter what is the number of our witnesses, the purity of their character, and the extent of their learning, their evidence is considered inadmissible, at least upon this subject, simply because they are Homœopathists.

The imperceptibility of the action of our medicines has given ground to the suspicion, that Homœopathy and nature are synonymous. On the other hand, the obvious action of Allopathic drugs fixes the idea of *cause* in the mind, to which subsequent phenomena are very apt to be attached as the *effects*. Indeed, a heavier onus lies upon the Allopathic profession than upon ours, to prove that their recoveries are really caused by their medicines, and not merely coincident with

their administration. Patients frequently recover from diseases in spite of the physician, and cases of monstrous maltreatment have sometimes constituted the basis of great professional reputation. There are two causes for the imperceptibility of our medicines, which are seldom taken into account. The first is, that they act upon the nerve centers, modifying the Nerve Force just as it is generated. The unmodified force is the cause of the morbid symptoms. By changing it medicinally, we produce no other symptoms in the peripheries than the disappearance of the disease. This is evidently the beau ideal of Therapeutics, and to offer a theory of the physical laws by which it is accomplished, is the main object of this little treatise. The other reason why our medicines act imperceptibly, is, that they coincide with or act in the direct line of the disease. In the immense shadows of evening the smaller shadows of terrestrial objects are invisible. It is the antagonism of the medicine and the disease, which renders the action of Allopathic doses, good or bad so apparent. If an Allopath used a cathartic for diarrhea, he might find it very difficult to distinguish between the action of his remedy and the natural course of the disease. The results must be the only test.

The frequency of recovery is not the only positive reason for believing our medicines to be energetic. Every Homœopathic practitioner has repeatedly produced with his infinitesimals, aggravations of the disease, at times and under circumstances when they could not possibly be enrolled as part of the natural history of the disease. Again, if all our substances be equally inert, how is it that we learn by experience

that a certain substance is more reliable than others in a particular case? And how exceedingly ridiculous must be the discussions of learned and respectable men in Homœopathic Medical Societies on the relative value of different articles, and of different degrees of attenuation! What is the *ad captandum* motive in these private discussions, frequently conducted with that zeal, spirit, and capacity, required in the investigation of scientific questions? Moreover, as Homœopathic physicians all use the same agents, how does it happen that one physician is so much more successful than another? The capable Homœopathist establishes a wide circle of friends and practice, which he retains just as long as he desires. The charlatan, who has taken it up for gain without proper qualification, uniformly breaks down, blasting his own character, and deeply injuring a noble cause by his contemptible conduct. But, perhaps, the most convincing evidence we have of the curative action of attenuations, is the promptness of amelioration, very often as surprising to the physician as to the patient. This relief is sometimes almost instantaneous, for which a very plausible reason can be given. Some of these cases may be spontaneous, but these spontaneities are remarkably apt to follow the administration of a few Homœopathic pellets.

In Dr. Neidhard's "Homœopathy in Germany and England, in 1849," I find a tabular view of all the cases treated in the Vienna Homœopathic Hospital, from January 1st, 1835, to December 31st, 1843. It is a remarkable document, and well worth a candid inspection. Upon a part of this statistical material, Dr.

Forbes based his liberal concessions to Homœopathy, which have never been repeated or imitated in this country. As it can do no harm to refresh the medical mind with the memory of one great and independent man, I will transcribe a few of his opinions upon these Reports, before I draw my own deductions from their continuation during several succeeding years. "These tables substantiate this momentous fact, that all our ordinary curable diseases are cured, in a fair proportion, under the Homœopathic method of treatment. Not merely do we see thus cured all the slighter diseases, whether acute or chronic, which most men of experience know to be readily susceptible of cure under every variety of treatment, and under no treatment at all; but even all the severer and more dangerous diseases, which most physicians, of whatever school, have been accustomed to consider as not only needing the interposition of art to bring them to a speedy and favorable termination, but demanding the employment of prompt and strong measures to prevent a fatal issue in a considerable proportion of cases. And such is the nature of the premises, that there can hardly be any mistake as to the justness of the inference. Dr. Fleischmann is a regular, well-educated physician, as capable of forming a true diagonsis as other practitioners, and he is considered by those who know him as a man of honor and respectability, and incapable of attesting a falsehood. * * * * * * No candid physician, looking to the original report, or at the small part of it which we have extracted, will hesitate to acknowledge that the results there set forth would have been considered by him as satisfactory, if they had occurred in his own practice.

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The result presented to us in the severer internal inflammations, are certainly not such as most practical physicians would have expected to be obtained under the exclusive administration of a thousandth, a millionth, or a billionth part of a grain of phosphorus, every two, three, or four hours. It would be very unreasonable to believe that, out of 300 cases of pneumonia, 224 cases of pleurisy, and 105 cases of peritonitis, (in all 629 cases,) spread over a period of eight years, *all* the cases, except the fatal ones, 27 in number, were slight, and such as would have seemed to us hardly requiring treatment of any kind. In fact, according to all experience, such could not be the case. But independently of this *a priori* argument, we have sufficient evidence to prove that many of the cases of pneumonia, at least, were severe cases. A few of these cases were reported in detail by Dr. Fleischmann himself, and we have ourselves had the statement corroborated by the private testimony of a physician (not a Homœopath) who attended Dr. Fleischmann's wards for three months. This gentleman watched the course of several cases of pneumonia and traced their progress, by the physical signs, through the different stages of congestion, hepatization, and resolution, up to a perfect cure, within a period of time which would have appeared short under the most energetic treatment of Allopathy."

As Dr. Forbes could not bring himself to believe that our attenuations could possibly have any effect—his general inference was that Allopathy—as a curative art, was greatly overrated by its adherents, and that nature after all was the great physician. It certainly must be very humiliating to a bigoted Old School physician, to see our "moonshine medication"

favorably compared with "the accumulated experience of ages," and that too by one of the greatest Allopathic physicians of modern times. But let us look at the Hospital Reports:

Firstly. There is a large class of cases, *not one* of which is reported as having been cured. For instance, abscess of the brain 3, aneurism of the heart 1, cancer 7, caries of bone 7, dropsy of the brain 9, hydrothorax 38, organic disease of the heart 33, inflammation of the veins 3, medulary sarcoma 8, tape worm 1, induration of the stomach 10, pulmonary consumption 207. If the most rabid Allopathist can detect any thing which savors of quackery and unfounded pretention in the above items, he has optics keener than mine. The gentlemen who treated the cases and reported them, have as little sympathy with Brandreth's Pills and Rogers' Liverwort and Tar, or quackery in any form, as any Editor or Professor, dead or living, in the Allopathic School. Dr. Forbes noticed the fact that these incurable diseases occupied the same black column in the tables both of the Old and New School. The Old school has no reason to give why some of these diseases are not as curable as others, but our philosophy of medicine points immediately to the true cause. We have never yet discovered drugs which produce pathological conditions at all analogous to those diseases. This is the only scientific test of curability or incurability. Those diseases of the abdominal viscera, the lungs, the nervous system, and the skin, which are most readily and specifically simulated by drug action, are the precise ones in the treatment of which Homœopathy exhibits an unapproachable supe-

riority. In the unexamined store house of nature's treasures, substances may yet be brought to light by the Homœopathic method of proving, which shall be to cancer what quinine is to intermittent, and to epilepsy what lemon juice is to scurvy. Some future disciple of Hahnemann may discover Dr. Rush's hypothetical flower, and render Phthisis Pulmonalis as insignificant as a head-ache, or the chicken-pox. But he must be animated by a self-sacrificing enthusiasm for science, which is rarely to be met with at the present era of the medical profession.

Secondly. There is a class, of which *all* the cases were cured. Examples—apthæ 5, burns 40, chloro- 128, spasmodic cough 18, rheumatic fever 930, gastric diseases 196, chronic hoarseness 13, lead colic 49, 49, scrofulous inflammation of the eyes 21, pericarditis 8, hepatitis 7, cystitis 4, ovaritis 3, abnormal menstruation 36, convulsions 128. These diseases are sometimes very severe, but all are curable under any or no system. But the table shows that Allopathists have given an immense amount of medicine very uselessly—if the same diseases in such large numbers recover spontaneously on Homœopathic nothings.

But a third class of cases, of which a portion was fatal, is well calculated to astonish the candid practitioner, and convince him that he must either impeach the whole testimony, or acknowledge the propriety of a better investigation of Homœopathy than any that has ever yet been made. Professor Paine, of the New York University, confesses to have found 1-16th of a grain of quinine quite as efficacious as one or two hundred times the quantity is said to have been by

other physicians in intermittent and remittent diseases. By what process of ratiocination can it be inferred that the second or third attenuation of Cinchona is entirely inert, when 653 cases of ague and fever out of 658 are cured by its use? Again, out of 140 cases of gout, 134 are dismissed as cured, 2 as incurable, and 4 die. Of 52 cases of influenza only 1 dies. Of 49 cases of scarlet fever, 3 are fatal; of 312 of erysipelas, 2 are fatal; of 165 of small pox, 15 are fatal — 1 in 11 — better luck, I venture to say, than hospitals can often exhibit. Of 486 cases of inflammation of the joints, only 6 are fatal; and of 655 cases of inflammation of the throat, only 1 is fatal; of 73 cases of colic, all are cured; of 48 of cholera morbus, 43 are cured; of 199 of diarrhea, 196 are cured; of 72 of dysentery, 69 are cured.

After these specific statements of the congeneric diseases, we may believe that the 732 cases reported as Asiatic cholera, were really that disease, well-marked and distinguished from both diarrhea and cholera morbus. Of these 488 were cured, and 244 — exactly one-third — died. This is a very interesting point, because it was a test question between the two schools in Vienna. The practice of Homœopathy was prohibited in Austria, at the time of the opening of this hospital, which was allowed only by special favor, and the influence of a powerful nobleman. During the cholera epidemic, a Government commission was appointed to examine into the treatment of the different hospitals, and to make accurate reports twice a day. When the reports were laid before Government, it turned out that, while two-thirds of those attacked had died of the dis-

ease in the other hospitals, under every or no kind of treatment, two-thirds of those treated in the Homœopathic hospital recovered. From that time, not only were the laws against Homœopathy repealed, but means were provided by Government for the instruction of students in its principles and practice. And there are, at this day, more than forty practitioners of Homœopathic medicine in the very city where it underwent its severest trial, under the surveillance of watchful and suspicious rivals.

Comparisons are invidious — but the public practice of physicians is public property, and it is only thus that we can get at any valuable result which may be elicited from the numerical method. The mortality from inflammation of the lungs, in the Hotel Dieu, under the care of Chomel, during nine years, was about one in eight, while, during the same length of time, in Dr. Fleischmann's hospital, the mortality from the same disease was only one in sixteen — or one-half as great as the other. In the Duchy of Brunswick practitioners are obliged, under pain of heavy penalties, to keep a faithful register of cases treated and deaths occurring. Duke William, of Brunswick, appointed a committee of inquiry, to examine the books of all the physicians of both schools. The accounts had been kept for periods varying from four to ten years. The highest Homœopathic proportion of mortality was three in the hundred, the lowest, less than one, whilst the Allopathic proportion ranged from eight to ten.

But if these contests on the continental theater, from their remoteness, excite but little interest, let the reader analyze the reports of public and private practice in the

British Journal of Homœopathy, and in the North American Homœopathic Journal. I am perfectly aware of the many sources of fallacy, which may corrupt and invalidate this statistical method. But the objections apply to Allopathic as well as Homœopathic reports, and we adduce only just such evidence as we are expected to believe when it come from Allopathic authorities. Medical men, like all others, profess to be willing to believe what is demonstrated. But with a strange inconsistency, the majority of them will neither examine this subject for themselves, nor trust the reports of others, except when those reports are unfavorable. So morbid is the tone of the profession upon this point, that the mere fact of a physician's investigating the obnoxious theme, subjects him to the most illiberal suspicions. I am confident that their incredulity is not to be attributed to lack of evidence, but to cherished theoretical principles, which antidote the truth at the threshold of the mind. Until these are removed, "neither will they be persuaded though one rose from the dead."

The real force of a projectile can not be distinguished from its apparent force until we have estimated the degree of resistance it has had to overcome. Homœopathy has passed and is still passing through a violently resisting medium, but from its accelerating speed, and accumulating strength, we can not doubt of the ultimate success of its transit. It claims our admiration for what it has done, and our brightest anticipations for what it promises to do. An appeal to the intelligent and liberal portion of the medical profession, in behalf of Homœopathy, may be safely based upon five distinct grounds.

1. A closer scrutiny will show that the principles of Homœopathy are nearly related to those of the physical sciences—indeed almost as much so as one book of Geometry to another.

2. The mass of legitimate evidence accumulated in favor of its practical superiority to all other methods, must sooner or later enforce the attention of honest and capable men, and a strict analysis of that evidence is cordially solicited.

3. The trials it has received from the unconverted portion of the profession have been partial, premature, and unsatisfactory.

4. The objections to it as a System of Medicine are unfounded, and all attempts to classify it with or compare it to quackery in any form, are not only illiberal but absurd. They have always arisen from that narrow-mindedness which can not separate the conduct of certain men from the principles they profess to advocate, and can not distinguish between the good and the bad in any field beyond their own finite circle of perception.

5. The detected ignorance and misrepresentation of the Allopathic press with respect to the real scope and claims of Homœopathy, are not only astonishing and humiliating, but render all expressions of opinion on the subject from that source, comparatively worthless.

From these considerations I urge, that every professional man who is imbued with love of truth or magnanimity of spirit, should feel under personal obligation to search and see whether justice or injustice has been meted out to the principles and advocates of Homœopathy. In the words of the Brit. and For. Med. Chir. Review, with respect to Mesmerism—"It will doubt-

less require the exercise of some moral courage to touch a subject so defiled with empiricism; but the merit of the investigator will only be the greater, and success the sweeter. He should be undeterred, on the one hand, by the blind zeal which condemns without discrimination, and on the other, by the blind credulity which asserts and defends with fanaticism."

METHOD OF CONDUCTING THE INVESTIGATION.

Sir John Herschel, in his admirable "Discourse on the Study of Natural Philosophy," describes the scientific process of investigation, which I wish had been always pursued by those who have endeavored to test the merits of Homœopathy. As I propose, in this chapter, besides incidentally meeting some minor objections, to sketch the only course of inquiry, which the friends of Homœopathy will acknowledge as an *experimentum crucis*, I will take the liberty of extracting, for the benefit of my Allopathic readers, some salutary advice from the pages of that eminent philosopher.

"Experience once recognized as the fountain of all our knowledge of nature, it follows that in the study of nature and its laws, we ought at once to make up our minds to dismiss, as idle prejudice, or at least suspend as premature, any preconceived notion of what might or what ought to be the order of nature in any proposed case, and content ourselves with observing, as a plain matter of fact, what *is*. To experience we refer, as the only ground of all physical inquiry. But before experience itself can be used with advantage, there is one preliminary step to make, which depends wholly on ourselves; it is the absolute dismissal and clearing the mind of all prejudice, from whatever source arising, and the determination to stand or fall by the result of a direct appeal to facts in the first instance, and of strict logical deduction from them afterward."

After stating that there are two classes of prejudices, those of opinion, and those of sense or our uncorrected sensation, he continues in the following manner: "By prejudices of opinion, we mean opinions hastily taken up, either from the assertions of others, from our own superficial views, or from vulgar observation, and which, from being constantly admitted without dispute, have obtained the strong hold of habit on our minds. * * * * * It is unfortunately the nature of prejudices of opinion to adhere, in a certain degree, to every mind, and to some with pertinacious obstinacy, *pigris radicibus*, after all ground for their reasonable entertainment is destroyed. Against such a disposition the student of natural science must contend with all his fervor. Not that we are so unreasonable as to demand of him an instant and peremptory dismission of all his former opinions and judgments; all we require is, that he will hold them without bigotry, retain till he sees reason to question them, and be ready to resign them when fairly proved untenable, and to doubt them when the weight of probability is shown to be against them. If he refuse this, he is incapable of science." From these sentences the conscientious physician may judge for himself, whether or not he comes to the study of Homœopathy in the right spirit; and I would respectfully tender him some hints as to conducting it in the right manner.

Some physicians begin by reading, or trying to read, a little Homœopathic literature. They soon meet with errors of statement, fallacious arguments, hasty generalizations, and probably unjust and denunciatory criticisms on Allopathy. In the practical phasis of the

subject every thing appears uncouth, and a great deal absolutely incredible. Forgetful that it is always long before the chaff is separated from the wheat of a new philosophy, they hastily conclude, that a system which contains so much that is unauthenticated, erroneous, and speculative, must be fundamentally false. This premature decision unfortunately is seldom reversed, because having once laid the question on the shelf, they are with great difficulty persuaded to resume its consideration. They seem to have supposed that Homœopathy sprang in perfect form from the brains of its early advocates, and when they see how imperfect it is, pronounce it a monstrous birth which can not live, or which ought to be destroyed. They forget, that in its present condition it is like the rude outline of a great painting, which is to be filled up with living forms and modified by the touch of successive masters into beauty and power.

Others of a more practical turn, provide themselves with a "Domestic Physician" and a case of medicines, with which they proceed to give the system a clinical test. They know that facts may be discovered long before the appearance of any theory to harmonize them. The needle has been known to point to the north for centuries, but it is only through recent discoveries in terrestrial magnetism, that we have found even a plausible explanation of the phenomenon. They know, moreover, that facts of immense practical value are often possessed by people who can give no rational explanation of them. Prompted, therefore, by a laudable curiosity, they are disposed to give the subject an experimental test. They have caught the true spirit of inductive

philosophy, and are unfortunate only in its application. They do not suspect that any preliminary knowledge, not obtained by the common medical education, is requisite to the trial, and proceed by a kind of book routine to apply the medicine to the disease.

Now observe, that the physician is not called into that very class of cases, which can be managed so readily, with little professional knowledge, by the aid of a "Domestic Physician." The "Domestic Physician" of Homœopathy is but a rational, beautiful, and useful substitute for the vulgar empiricism which always haunts and sometimes depopulates the domestic hearth. By its light, the father or mother speedily and surely relieves the fretfulness and wakefulness of teething children, the head-ache, the ear-ache, the tooth-ache, the colic, the catarrh, the diarrhea, the ephemeral fever, and other diseases, which receive a good deal of family medication, before it is considered necessary to summon the doctor. Our inquirer arrives at the bed-side and begins the use of his "Domestic Physician," just where a Homœopathic family, distrustful of their capacity, would have abandoned it and called their medical attendant. Now he will scarcely credit me when I assure him, that he is very little more capable of conducting the case Homœopathically than any intelligent layman. He may make the most accurate and scientific diagnosis of the disease, but if he does not possess an intimate knowledge of drug-pathogenesis, he will find it very difficult to select the appropriate remedy.

He may possibly stumble upon some clear cases and become a convert, but he will be more indebted to

accident than to inductive reason for his good fortune. Most probably after a few trials he will become disgusted with his want of success, and pronounce the whole system false and absurd. But although he may congratulate himself on his liberality of spirit in examining it all, and do Homœopathy a vast injury by promulgating the unfavorable result of his trial, he can not convince me that his method of investigation was fairly adapted to the demands of the subject. I experimented in a similar manner for a long time, and although occasionally puzzled by striking successes, came to the general conclusions of Dr. Forbes. At last, however, the truth loomed slowly up before my mind, that the pathogenesis of drugs was, indeed, a vast and distinct science, the true key to Homœopathic practice, and quite as necessary to it as a dictionary to the study of a foreign language. It is the main object of this chapter, to show what we mean by the pathogenesis of drugs, how a knowledge of it is to be acquired, and what use is to be made of it. Here, and here mainly, lies the difference between the two schools of medicine.

Pathogenesis means the production of a morbid condition, and is equally applicable, as a definition, to the effects of disease and of drugs. The Allopathic systems of classification and study have hitherto prevented the development of this science. This has arisen from looking at the human body as a segmentary fabric, and not as a connected whole, the parts of which are co-ordinated and mutually dependent. The tissues of the living organism are so anatomically and sympathetically woven together, that no matter what

be the seat or nature of an impression some changes must and will be propagated by it to the remotest parts of the system. This is the law of physical nature, and instead of abandoning it we should make it our guide in the analysis of vital and pathological phenomena. A cause which increases the heart's impulse by a single stroke in the minute, affects thereby all the organic capillaries of the body. The failure of a solitary hepatic cell to discharge its functions involves a greater or less modification of every other function in the apparatus of life. There can be no such thing as persistent local perturbation in the human form. Disease becomes ever and necessarily a general condition. True, there is always a central group of symptoms, around which the others cluster and on which they depend. These prominent features form the basis of classification, and to these alone is Allopathic medication generally addressed.

Not contented with this partial view, we take into consideration every remote and apparently insignificant symptom. To illustrate by example—I had a case of measles which seemed stationary under the use of Belladonna. The fever, the head-ache, the rash, the catarrhal symptoms, all indicated its employment. On examining more minutely I found there was considerable pain and stiffness of the knee joints. Now Bryonia not only covered many of the Belladonna symptoms of the case, but superadded a new power—because our provers have repeatedly found it to produce "tensive, painful stiffness of the knees." Belladonna and Bryonia were given in alternation. The case commenced improving almost immediately, that symptom disappear-

ing first. In every case of Homœopathic treatment the thorough application of all the points of a remedy to all the points of the disease, is the one desideratum. In the vague, revulsive, and perturbating treatment of Allopathy, it is never thought of. The occurrence of a symptom like the above would not modify the course of the practitioner, who looks to purgation and diaphoresis as established processes of cure.

But it is more particularly in the knowledge of the entire range of drug action, that Allopathists are deficient. Here, too, they seize the central and prominent symptoms, and make no use whatever of the drug as an article capable of producing an exact and extended pathological condition. Colocynth is classed as a cathartic, and probably nine-tenths of the Old School profession never heard of its power to produce and to cure some forms of neuralgia. Ipecac is so well marked as an emetic, that its power of producing asthmatic symptoms, although commonly recognized, is never taken into consideration in its prescription. It is surprising to notice how many articles are set down in Pereira's Materia Medica, as occasioning cutaneous eruptions. Why is it, that Allopathic men of science have never studied more accurately the physiological significance, and, indeed, the pathological anatomy of these eruptions? Simply because they have never looked at the capacity of an article to produce a symptom—as the expression of its power to cure it—the mute pantomime of nature pointing us toward the Homœopathic law.

It is acknowledged, that by the prolonged or excessive use of a drug the whole system becomes impli-

cated. The use of Mercury, Quinine, Arsenic, Iodine, Digitalis, and many of the acro-narcotics, furnish examples. In proportion as the local action of a drug is merged into its general action, the resemblance between natural and drug diseases becomes apparent. The diagnosis between drug diseases is quite as difficult as the diagnosis between natural diseases, and the Homœopathic practitioner must be as skillful in the one as in the other. Drugs used upon healthy people have a specific and uniform effect, leaving out those cases of idiosyncrasy which no system can explain. Upon sick people their action is entirely relative, so that observations based upon their use in such cases can have only an empirical, and no positive and scientific value.

We know of no medicines, however, which produce the exact diseases described in the book. We have nothing to produce measles, or syphilis, or erysipelas, or intermittent fever. I think the remarks of Magendie to his class, before which he made his experiments on animals, are too strong. "You saw me," says he, "give rise at my pleasure to pneumonia, scurvy, yellow fever, typhoid fever, not to mention a number of other affections, which, so to speak, I called into being before you." We only claim to produce with drugs a pathological condition, *similar* to that existing in disease, at the time the medicine is given. True, all of this minute and thorough knowledge is useless to those who prescribe on the principle "*contraria contrariis curantur.*" When a man thinks he can relieve a fever by scouring out the intestines, he needs only to know that colocynth or calomel, in certain doses, will effect

his purpose. But, before trying Homœopathy, he must make himself acquainted with the use and nature of Homœopathic weapons. From my own experience, the pathogenesis of drugs demands more mental labor than any other department of medical science. And I would here ask the candid physician, what is there in these views to degrade the scientific character, and limit the usefulness of the profession? Upon what page of the annals of quackery are their analogues to be found? Do they not indicate a wish to strengthen, widen, and render positive the basis of our knowledge? Do they not point to new fields of investigation, and arouse the ambition of the genuine lovers of science to tread them? Her children may not have caught her spirit, but the motto of Homœopathy is "*Excelsior*."

Toxicology, a science chiefly used by the Allopathist to diagnose and remedy the effect of poisons—a merely occasional duty of the healing art, not only subserves us the same end, but is also the basis of much which is significant and durable in our Therapeutics. It is as necessary for us to study the ravages of a poison from its first inception till the extinction of life, and then the anatomical lesions it has produced, as it is to note the rise, progress, and termination of diseases. Accordingly, the Homœopathic Journals collect eagerly and from all sources, every authentic item of information bearing upon this great subject. From these gleanings, and from Christison on Poisons, and the chapters in Pereira's Materia Medica, on the physiological action of each article, may be derived a fundamental idea of drug pathogenesis.

But however useful this method of research as estab-

lishing in our minds a general basis, there are circumstances which obviously impair its value, in giving us correct and specific impressions. In a case of virulent poisoning we see only the last and worst features of the pathogenesis. The system succumbs too speedily under the malignant shock. The beginning and the end are crowded too near together. As when we see a fiery circle produced by the rapid revolution of an ignited stick, so, in this case, a series of successive and connected phenomena is imposed on our senses almost as a unity. It is like a panorama which passes too quickly for us to recognize the distinct pieces and figures of the scenes. From such violent impressions and rapid action, we can scarcely elicit that connected chain of pathological phenomena for which we are seeking. It is desirable, therefore, to make our panorama move more slowly. A gradual and persistent action of the medicine must reveal more clearly its distinctive features. The action of the drug must be made, if possible, to resemble the incubation, development, and declination of disease itself. Only thus can drug action be brought into its accordant parallel with disease. Here experiment must be substituted for observation. Observation is noticing facts as they occur; without any attempt to influence the frequency of their occurrence, or to vary the circumstances under which they occur. Experiment is putting in action causes or agents over which we have control, and purposely varying their combinations, and noticing what effects take place. Such are Herschel's definitions of the two processes which are the fountains of all natural science.

The first suggestson is, of course, to experiment upon

animals, and it has been done to a very great extent. Much valuable information has been thus obtained, and the future Magendie of Homœopathy, instead of mutilating animals with the knife, will poison them with all possible precaution and accuracy, and then seek for the post-mortem appearances as for buried treasure. But there are objections also, which will show that this stream of knowledge is liable to be tainted with inaccuracies. The effects frequently vary with the animal upon which we operate. Sometimes the effect produced upon the animal are not at all analogous to those known to be produced upon man. This is a serious objection, and must have its cause hidden deeply in the philosophy of animated nature. Moreover, by this method, we only get at the *objective* symptoms. Indeed, the *subjective* phenomena, which are sometimes of vast importance, are vaguely and inadequately described, even by non-professional persons of intelligence. From these united considerations, Hahnemann and his coadjutors instituted upon their own persons those curious and extended experiments, which have been the ridicule of this, and which will be the wonder of every future age. The records of their generous labors have been given to the world. I will suppose that embodiment of them, known as Jahr's New Manual, Vol. 1st, to be in the hands of our candid investigator, not that it is the best, but because it is more readily procured, and more generally used.

Here is a ponderous volume, professing to contain the pathogenesis of a great many drugs. As a literary curiosity it should attract attention, as the careful production of scientific men, it demands the most careful

scrutiny. It is indeed a wonderful book, and not to be dismissed with a cursory examination. None but those who linger long over it will derive any instruction from its enigmatical face. Many physicians, indeed, on the first inspection throw it indignantly down and denounce it as a tissue of absurdities. Others look on it as a kind of medical Don Quixote or Gulliver's Travels, containing very choice bits for laughter and ridicule. These would-be Alexanders of the profession cut instead of unraveling the Gordian knot. Impostors, who batten upon the credulity of their fellow-creatures, and whose ignorance and baseness are sheltered by the secrecy of their manœuvres, could scarcely hope to further their sinister designs by writing, publishing, and recommending such a volume as this, which does not bear upon its front a single plausibility to catch the public or the professional eye. Its progress is made against the combined opposition of all our prejudices of opinion and of sense. Nevertheless it has run through several editions in the three great languages of the world, and is constantly receiving revisions and addenda. The day of justice may be deferred, but the profession will be at last compelled to take up this book of Pathogenesis, and give it a fair and thorough criticism.

Pathogenesis is a natural fact, or a series of facts; this book is an attempted picture of it. It is not a daguerreotype — it is indeed very imperfect. There is a chaotic appearance about it which is quite repulsive. It is an aggregation of all the symptoms produced by drugs upon a number of individuals. These are collocated without any explanation or distinction of the circumstances under which the symptoms were produced.

There is no statement as to the age, sex, habits, or constitution of the prover, and none as to the dose of the medicine, or the time and frequency of its repetition. A great many phenomena of disease, not produced by the medicine, are blended with the pathogenesis, and although accompanied by explanatory signs, confuse the mind. Many symptoms are so trivial in their character, that they appear more like the imaginations of a healthy man expectantly watching his own organism, than the positive and uniform operations of a drug. Many of them were probably accidental. The various stages of drug action are not prominently distinguished. The subjective phenomena can be but obscurely grasped, for every man describes his own feelings and pains in his own way, and the same explanatory adjective may convey a very different impression to two minds. And there appears to me something unnatural in the grouping of the symptoms, according to their occurrence in different parts of the body. A true pathogenesis should be like a perfect history of the rise, progress, and decline of an empire. This resembles a book in which the integral pieces of the history are taken apart; the foreign wars given here, the domestic revolutions there; the negotiations in one place, the statistics in another, etc. But it would be difficult to suggest, and still more so to make a better arrangement. It is always much easier to mark than to remedy the defects of a great work.

Notwithstanding all these disadvantages, and many others not pointed out, but which I am willing to concede, I repeat it that Jahr's Manual is a wonderful book, and more useful than half the volumes in our libraries.

I may even go further, and say, that the conception, concoction, and publication of such a work, constitutes an era of vast importance in the history of the world. We have at last extracted the pure marble from the bosom of the mountain. Under the hands of busy laborers it is assuming a definite outline. Other artists, more capable and zealous than ourselves, will pare and polish and sculpture it down, until it is wrought into a statue of perfect beauty and grace.

If, notwithstanding the number, respectability and capacity of the provers, the Homœopathic statement of pathogenesis be received with incredulity, the conscientious inquirer has another task to perform, before he can be permitted to give that incredulity a positive and trust-worthy expression. He has impeached the testimony of others on theoretical, or at most, very questionable grounds, and he should bring his own personal experience to substantiate his assertions. This is no trivial undertaking, and very few men have either the abstinence or the patience to do full justice to the subject. Tea, coffee, tobacco, alcohol, and all excitant occupations and circumstances must be strictly avoided. Two considerations must also be borne in mind; firstly, that many anomalous symptoms occur almost every day in ordinary health, which might be mistaken for the action of the drug; and, secondly, that the concentration of the mind upon particular organs, has been known to have a remarkable effect in exciting them in an unusual manner. If a faithful experiment with any one of our articles be thus persisted in, and only those effects noted which are enforced on the attention by their prominence and peculiarity, the prover will become

convinced of the general reliability of the pathogenesis given in Jahr.

The first experiments were made with appreciable doses, repeated and increased at regular intervals, until the whole body was in a morbid condition, every organ being more or less affected. This is certainly the most reliable and efficient method of obtaining the pathogenesis of drugs. The doses must be small, because the general and true action is always obscured, and rendered less valuable by the great intensity of the primary and local action. The substance also should be triturated awhile with some inert material—as the sugar of milk—on the old principle, *corpora non agunt nisi soluta.* I have experimented in this manner with two substances, Aconite and Nux Vomica, both obtained from an Allopathic drug store. The results with Aconite, although in some respects resembling those detailed in Jahr, were unsatisfactory, owing to the impurity of the article. This was evident, because I took one hundred and eighty drops of the tincture in a day, with little effect, whereas the maximum dose is fixed by the U. S. Dispensatory at thirty drops. I used the powdered seeds of Nux Vomica in the dose of 1-20th of a grain. Dr. Wood says, "Nux Vomica may be given in powder in the dose of five grains, repeated three or four times a day, and gradually increased until its effects are experienced. In this form, however, it is very uncertain, and fifty grains have been given with little or no effect." My preparation was made with twenty parts of sugar of milk to one of Nux Vomica. I took it half a dozen times a day, for five or six days, adhering closely to the Ho-

mœopathic regimen. I was then compelled to leave it off, by the accumulation of its morbid effects. These corresponded very nearly to those given by Homœopathic authorities, and I am certain that I obtained a more precise and useful knowledge of the drug, than I could have done in any other manner.

But it will be said that nobody doubts the pathogenetic effects of drugs used for a long time in appreciable doses, and that the objections lie only against the power of Homœopathic attenuations either to cause or cure disease. The answer to this, as to all other questions not solvable by philosophical speculation, must be deduced from actual experiment. But I must maintain that there is a sophism—a deep fallacy—in the argument that, because a drug in a certain quantity exerts no action on a healthy man, therefore it can exert none in the same quantity on a sick man. Paris, in his Pharmacologia, says: "Physicians, in my opinion, have very unphilosophically advanced to conclusions respecting the inefficiency of certain agents. They have administered particular preparations in large doses, and not having observed any visible effects, have at once denounced them as inert. I might allude, for instance, to the tris-nitrate of bismuth, a substance which, however powerless in health, I am well satisfied from ample experience, is highly efficacious in controlling certain morbid states of the stomach."

But the fallacy of the argument is best discovered by considering what we expect to do with our medicines. Upon this subject I will be more explicit in another chapter. But here I may state, that we do not use our medicines to purge, sweat, narcotize, or to do anything

else which Allopathic physicians expect to accomplish by their drugs. We do not even aim to produce a similar disease which shall excite the reactions of the economy. With such vague and uncertain speculations I am totally dissatisfied. I do not hold that attenuation, beyond a certain point, increases the activity of medicines—but quite the contrary. I say that we attenuate in order to get the specific action of the drug in as infinitesimal quantity as possible. I shall endeavor to show, that the Nerve Force, like Heat, Light, and the correlated agents is propagated by undulatory motions in a given medium; that an abnormal state of this motion is the essential element of disease; that by exciting a similar state in the same medium we expect to modify this abnormal motion, and thus prevent or arrest the progress of disease in the peripheral structures; and that we expect to do this on physical principles and by physical laws. Now, a drug in a certain quantity may modify this abnormal motion, without being able to produce it in the same quantity. A degree of force may keep up a motion which it could never have produced. All have noticed the ease with which horses drag a load, the inertia of which it was very difficult to overcome. A drug may not be able to overcome what may be called the inertia of health; but yet, when that inertia has been overcome by some efficient cause of disease, it may modify the newly existing condition, to aggravate or to cure it. Such is the state of uncertainties, probabilities and possibilities in this unexplored question—that no positive argument would be made out *against* Homœopathy, even if not a single experimenter had ever discovered the slightest effect from our attenuations.

Fortunately, however, for those who can not admit the force of any ratiocination, not confirmed by the evidence of the senses, our attenuations even do produce pathogenetic effects. Men who swallow a hundred of the pellets at a dose, half-a-dozen or more times in succession without a particle of effect, are very incredulous on this score. But if there is any weight or value in human testimony, that weight and value is in favour of this proposition. The experiment, however, is tedious, and few will persist in it long enough to test the articles properly. I recollect taking one substance for eight days—six times a day, before any symptoms occurred which belonged to the drug. I had despaired of any effect, so that when I felt myself sick, I was about to take medicine to relieve my unpleasant feelings, when it occurred to me that I might be under the influence of the drug, and so, upon consulting Jahr, I found that I was. The skeptic will smile when I tell him that this article was our preparation of *Natrum Muriaticum*, or common salt. An intelligent physician, who used the same substance, experienced the symptoms within twenty-four hours. After using the 3rd trituration of *Platina* for a week, I felt symptoms which I had never had before, and which are ascribed to the metal by Jahr, but the pathogenesis was very imperfect and unsatisfactory. But experiments with the 2nd of *Podophyllum Peltatum* and the 3rd of *Bromine*, which I pushed, until the diarrhea and nausea produced by one, and the head-ache, hoarseness, cough, and thoracic oppression produced by the other, compelled me to desist from their use, were sufficient to convince my own mind of the real power of attenua-

tions. From *Digitalis* and some other substances, I procured no observable action.

The continual dropping of water on a stone will wear a groove into its surface, and so it is rational that the constant application of a morbid stimulus, however minute, should finally derange the economy. From my observations, which I confess, however, have been limited, I infer that the susceptibilities of different individuals to the same drug, and of the same individual to different drugs, vary indefinitely. Indeed, it is probable, that there are many individuals who can be affected by nothing but the crude article. A thousand such negative cases would establish nothing *against* the Homœopathic principle. The more obvious facts of Animal Magnetism, although subjective rather than objective phenomena, are quite well known and established. Although I have submitted myself to powerful magnetisers, none of them ever produced on me any effect, which was not clearly referable to the silence, the monotony, and the gentle friction of the passes. But I believe, upon rational grounds and the evidence of others, what my physical or mental idiosyncrasies do not permit me to make a matter of personal experience.

The fundamental truth, however, remains intact, that whenever effects are produced, by whatever dose, or in whatever individual, provided he be healthy, the same series of effects arises from the same dose with remarkable uniformity. This is a law which can not properly be deduced from the current mode of experimenting on sick people. Mercury will sometimes salivate with great facility, at other times it seems to be entirely

inefficient for that purpose. Opium, in one case, must be used with extreme caution, in another, it may be given almost by the drachm. Nor is it any more applicable to the causes of disease. The same cause may produce its effect only on one man in ten or a hundred. Ten persons may eat green apples, and only one be attacked with diarrhea. The same cause may produce different diseases,—wet feet may occasion dysentery in one person, pneumonia in another, fever in a third, and idiopathic tetanus in a fourth. Therefore, drugs used Allopathically, and all the known causes of disease, (except the purely specific, which are material substances like our medicines,) have only a relative significance. On the contrary, every drug has a specific action with regard to the healthy body, and there is no satisfactory evidence that this specific action can be uniformly and curatively exerted, except on a body impressed by disease with a similar pathogenesis.

For his own satisfaction, then, let our inquirer test upon himself some attenuated medicine procured fresh from a reliable Homœopathic pharmaceutist. I suppose him to be intellectually above making the stale jest about the number of stakes which have been employed in what is called the potentization. He will follow all the dietetical and other directions, and as he can not be afraid of a few grains of sugar of milk, or a few drops of alcohol, and as we can never foretell individual peculiarities, he should allow the trial a liberal margin of two or three weeks. Some of our writers seem willing to stake the truth of Homœopathy on the result of this experiment. For reasons already stated, I am not, but I confess that I should be disappointed,

if three out of four such experimenters did not make a report of symptoms strikingly analogous to those recorded in Jahr's Manual.

If he does not choose to experiment on himself, and is willing to take the Homœopathic statement as provisionally true, let him study diligently the Polychrests, or our most useful articles in our Materia Medica. Before beginning their clinical use, it will be proper for him to familiarize himself with the outlines of Homœopathic practice, by the study of Hahnemann, Hartmann, Laurie, Marcy, and others. A still more judicious measure, would be to obtain the advice of some capable practitioner in the use of the remedies in particular cases, if his professional prejudices have not sundered his social relations with all the gentlemen of the New School. He would derive much benefit from analyzing the cases reported in the Homœopathic Journals. Andral excused himself from this duty on the plea of ignorance of the German language. But although the German is still the great repository of Homœopathic literature, quite enough for his purpose may now be found in his native tongue. When he comes to the bed-side, it is his first duty to get as thorough a knowledge of the disease as the utmost reach of Allopathic or other education will give him. The condition of his patient must be as clear to him as the pathogenesis of his drugs. The neglect of a single inquiry, the misappreciation of a single symptom, from want of physiological or pathological knowledge, may mar the mental impression, and diminish the chances of successful treatment. Superficial investigation and hasty conclusions are suicidal to the Homœopathic practitioner.

Marenzellar, the great Austrian, occupies an hour and a half with each patient, regardless of the time which might be spent in making money, and with a scientific spirit and lofty conscientiousness, which should put his scoffing opponents to the blush. Animated by this spirit, our investigator, from a vast storehouse of similar and yet dissimilar articles, must select his remedy, in the administration of which he is to observe all the niceties and precautions enjoined by the best authorities. He may think many of them empirical, and even ridiculous; but in testing the claims of á new system, based on experience, he has no right even to neglect its empirical formulæ. Let him pursue this course carefully and impartially, until he satisfies himself of the truth or falsity of Homœopathy. I need scarcely remind a medical man, that no trial can be trustworthy which has not embraced a number and variety of cases, and extended over a considerable period of time. If the proper preliminary measures have been taken, I can have no apprehension as to the result of the practice.

There is a point of practical importance which the young practitioner will do well to remember. He will, of course, endeavor to choose a drug which covers more of the symptoms of the disease, and covers them more accurately than any other. But he must not reject an article because it has many more symptoms than the disease. Diseases and drugs may be considered as individuals, with specific differences just as trees are individuals all belonging to the vegetable kingdom. By the leaves alone we may distinguish the oak from the walnut, the maple, the beech, the cherry, the locust, etc., etc. Indeed, so true is the correlation of parts,

that Cuvier from a fragmentary fossil could re-construct in idea the whole pre-Adamite animal to which it belonged. When we have a patient with a sore throat, for instance, we must look on this as a protruded segment of a general disease, which is undeveloped. As the vegetable physiologist infers the nature of the wood, or the roots, or the secretions of a plant from its leaf, so from the given symptoms we infer what the case would be, if all the correlated parts made their appearance. Accordingly there is a Belladonna sore throat, a Causticum sore throat, a Nux Vomica sore throat, etc., and these articles will be curative to the throat, although none of the other symptoms of Belladonna, Causticum, or Nux Vomica, be present in the body. The action of the medicines on the unaffected parts is so slight as to be unnoticed and harmless, while on the diseased tissues it is specific and curative. This is one of the great advantages of attenuation.

Such is the course of inquiry best adapted to get a just and thorough knowledge of the subject. Nothing less will enable any man to pronounce an opinion for or against Homœopathy. He who has not followed this course, although age and experience may give his dicta a nominal value, and genius and learning may have made him renowned, pronounces an opinion which is worthless, and his approval and his censure are alike insignificant. A trace of the old mortality will still linger in the practice of our proselyte, and he will be sometimes called upon to lament the inefficiency of art to resist the last demand of nature. As a morsel of comfort, I will give him an extract from James John Wilkinson, a member of the Royal College of Surgeons

of England, and a gentleman of rare literary and scientific ability.

"There is something unfair in the manner in which the public criticises cases that do not recover under Homœopathic treatment. None of our systems will cure every disorder. Nor is it to be expected that an art which is in its infancy can do more than greatly surpass in safety and virtue the Hippocratic method of two thousand years' standing. Yet, whenever a death occurs under Homœopathy, the neighborhood acts as though Homœopathy had invented death, which was a phenomenón unknown until Hahnemann brought it from the infernal regions! Why! the bills of mortality since Hippocrates, are the bills of Allopathy. And in most cases, let the worst that can occur, it is no more than happens daily under that practice. But if the patient dies under Allopathy, he dies by precedent, and there is no responsibility; if Homœopathy is at the bed side, he departs unsanctioned, and the survivors have to answer for him to public opinion. This must be borne until the battle is further fought, and those who are not prepared to endure it, had better not dabble in Homœopathy."

UNDULATORY THEORY OF THE NERVE FORCE.

"It is very important," says Dr. Carpenter, "that Physiological Science should be considered under the same *dynamic* aspect, as that under which the Physical Sciences are now viewed by the most enlightened philosophers." At the first glance, there appear to be in every department of nature, three distinct subjects of consideration—the *forces* acting, the *material* acted upon, and the *phenomena* produced. Although for practical purposes the ideal separation may be still necessary, our knowledge of their mutual relations has been greatly modified. The old conception of the material universe as being made up of matter and forces has given way to the more abstruse but philosophical definition, that the universe is *matter in motion.*

It was for a long time supposed that Light and Heat were rays of infinitesimal molecules, emanating in straight lines from centers, and impinging upon surfaces. Electricity was considered to be a current of invisible, intangible, imponderable fluid. Subsequent discoveries revealed that an undulatory theory would obviate the difficulties of the old hypothesis, without losing any of its advantages. It has accordingly been adopted by all the best scientific authorities, and pro-

pounded and illustrated with a mathematical precision truly astonishing. These undulations are supposed to be communicated through an ethereal medium which pervades all space, and penetrates through the recesses of all bodies. But Professor Grove has shown that this hypothetical ether may be very well dispensed with, for the undulations may be safely assumed to take place in the molecules of the various kinds of matter. Heat, Light, Electricity, etc., therefore are not *things*, but *states* of matter. When a bar of iron is heated, the molecules of iron are thrown into undulation which is propagated with definite form and character to the contiguous molecules of atmospheric air, and from them to the hand or thermometer. Thus the phenomena of radiation and conduction are truly transferences of motion. The undulations of Light, Electricity, Sound, etc., are entirely analogous to those of Heat, and the manifestations which they all present, are dependent upon the form of the substance from which they are evolved.

These causative motions must not be supposed to involve any transference of particles from point to point, which is the kind of motion most commonly recognized by our senses. There is a wide difference between the motion of a wave and the motion of the particles among which it is passing. When we disturb the middle of a watery surface, circular waves are propagated from the center to the peripheries of the surface. A feather or other light body placed upon the waves is not drifted forward with them, but remains motionless. The undulatory theory of motion includes also the supposition, which indeed is naturally irresistible, that there is no such thing or state in nature as a

vacuum—our use of that word having only a relative significance. We know nothing of matter itself: however paradoxical it may appear, it is true, that all our knowledge of matter is confined to its motions. A substance is heavy or light, hot or cold, red or green, sweet or sour, hard or soft, and fragrant or the reverse, according to the form of the undulations which emanate from it and impress our senses. The laws and phenomena of motion are therefore the fundamental elements of all inquiry and must constitute the most satisfactory data from which any species of deduction can be made.

Passing by for the present the astonishing analogies between the various undulations of matter, let us consider the curious but all-important question of their mutual convertibility. If they indeed are objects rather of mathematical than physical analysis, we may readily conceive them by change of form to be converted into each other—as a triangle may be stretched into a circle, or a circle into an ellipse, or a cube into a sphere. The idea may be illustrated in the simplest form by the experiment of exposing cloths of the same texture but of different colors, on a surface of snow to the action of sunlight. The amount of Heat absorbed is the same for all the pieces, since Prof. A. D. Bache has conclusively shown, that color alone does not modify the radiating power of a surface. The quantity of Light absorbed by the black cloth is evidently the greatest, because none is reflected, and it is the black cloth, we find, which always sinks the deepest into the snow. More Heat, then, has gone from the under surface of that cloth into the snow, than from any of the others,

although no more Heat was received by it, *as Heat*. Two questions simultaneously arise—what has become of the Light, and where did the surplus Heat come from? The Light can not be said to be *latent*, because by no possible means can it ever be re-produced from the cloth. But it is very easy to suppose, on the undulatory theory, that the undulations of Light passing into the cloth became modified by the organic texture of the cloth, and came out at its under surface as undulations of Heat. The original Heat from the sun received increments from each cloth, but most of all from that which reflected no Light—for all the Light passing through that one was converted into Heat.

Again—Friction, which is only impeded motion, is productive, without limit, of all the physical forces. When two smooth, homogenous surfaces are rubbed together Heat is evolved; if there be any inequality, Electricity is also developed; and if the motion apparently lost in resistance be very considerable, Light is also generated. Now this motion, or Force, is not lost or annihilated by the Friction, but has passed into the forms of Heat, Light, and Electricity—for the quantity of these produced depends exactly upon the degree of motive force expended in the Friction. This theory applied to the facts of Caloric, rids us most happily of that obscure and unphilosophical doctrine of *latency*. Boiling water and steam are always of the same temperature—212° F. But steam in being condensed into water gives out 950° of Heat, which are supposed by the old theory to have existed in the steam in a latent condition. What conception however can we form of a latent force, a latent molecule, or a latent undulation?

It is better to abide by the ultimate fact, and confess ignorance, than to propose a lame and impotent theory. On the hypothesis of mutual convertibility, the Heat supposed to be lost or rendered latent, is re-produced to our senses and for our use, in the form of Mechanical Power. By condensation, the Mechanical Force is again returned to its equivalent condition as 950° of Heat.

Heat also produces Electricity and Chemical Action, and both may be increased or diminished by the increase or diminution of the Caloric—which is undergoing the metamorphosis into these new forms of Force. Chemical Affinity produces Heat, Light, Electricity, Magnetism, and Mechanical Power. This last is strongly exemplified in the explosion of gunpowder. And in all these cases, the amount of new Force generated is exactly proportional to the rapidity and extent of the Chemical Action.

Professor Grove adduces the following experiment, to show the character of the motion impressed on the molecules of a magnetic metal during the period of magnetisation, and the convertible relation which Light bears to Electricity and Magnetism: "A tube filled with the liquid in which magnetic oxide of iron had been prepared, and terminated at each end by plates of glass, was surrounded by a coil of coated wire. To a spectator looking through this tube, a flash of light was perceptible whenever the coil was electrized, and less light was transmitted when the electrical current ceased. showing a symmetrical arrangement of the minute particles of magnetic oxide when under the magnetic influence."

The transmutation of Electricity into Heat, Light, Magnetism, Chemical Affinity, and Mechanical Power, is so common and obvious, that many philosophers regard that agent as the fundamental element in nature. A single example, however, will suffice to illustrate our principle. Suppose a current of Electricity, or, in other words, successive waves of molecular polarization, to be traversing a wire of which one portion is more slender than the other. Now, the thick part of that wire will allow the free transmission of a current which ignites the thinner portion. The force retarded, as it were, by the narrowness of the channel, does not accumulate beyond it, but is converted into Heat. An apparatus may be contrived to present to us at the same time the same Force under several different forms. Suppose the terminals of a Voltaic battery to be connected by a platinum wire, which is itself immersed in water. Chemical Action goes on in the battery between the zinc and the water which is being decomposed. The Force liberated or generated by the decomposition, traverses the connecting wires as a Galvanic current. The platinum wire exhibits it under the form of Heat. The water boils, and the original force is still continued in the form of Mechanical Power. Between all these Forces there is such an exact ratio, that we can not resist the inference that we are only tracing the progression of the same Force through different media. This is but a picture on a very small scale of what is perpetually occurring and recurring in the material universe. It is well known, that while the forms of matter are continually changing, the matter itself is persistent. None is ever created, and none is ever lost.

A higher and more philosophic mode of stating this proposition would be, that the motions of matter are in a state of incessant mutual transmutation. Every organized being, vegetable or animal, gives back to inorganic nature not only the material but the Forces which it received from it. And in the burning of coal, we are giving back to the atmosphere, not only the material molecules, but the Heat and Light of the carboniferous period.

The vast and important bearings of the principles here involved are not visible on the first inspection, and many minds, without going farther, will be tempted to reject the whole theory as a crude and fanciful speculation. Nothing of it is original with myself; and I have received it principally because it bears the sanction of the great names of Carpenter, Grove, Paget, Faraday, and Matteucci. For all the facts I have detailed, and others of similar value, see an article on the Correlation of Forces, Physical and Vital, in the Brit. and For. Med. Chir. Review, for July, 1851. The author signficantly remarks: "To the minds who have been led, by their exclusive devotion to some one branch of scientific inquiry, to look rather at the distinctions than at the points of accordance between these Forces, to study them in their isolated manifestations, rather than in their reciprocal bearings, it may be difficult to conceive of such a conversion or metamorphosis. But the difficulty is far less to those who have been accustomed to look deeper than the phenomenal surface, and to consider the nature of Force in the abstract."

The fact being conceded, that the so-called Forces of nature are motions of matter, capable of being sub-

mitted to mathematical analysis, and, moreover, mutually convertible, we might *a priori* expect to discover the most remarkable analogies between them. And the researches of modern philosophers have been so successful upon this point, and their discoveries so numerous, that nothing but a bare statement of the results, can be admitted into a treatise of this kind. The mathematical principles which govern the moveable elements of air and water, applicable alike to the explanations of whirlwinds, water-spouts, undulations of fields of grains, and to all the phenomena of sound, have been transposed to the more subtle, but in reality more powerful, motions of matter. Moreover, the laws by which Heat and Light are radiated, reflected, absorbed, refracted, and polarized, are perfectly identical. Mrs. Somerville calls Heat invisible Light, and Light luminous Caloric. The five species of Electricity, the common, the voltaic, the magnetic, the thermal, and the animal, have been demonstrated by Faraday to be identical. Differences in intensity and quantity are quite sufficient to account for what was supposed to be their distinctive qualities. That great electrician has also demonstrated the identity of Electricity and Magnetism to the entire satisfaction of all philosophers. And, finally, the influence of Heat on magnetic bodies, and of Light on the vibrations of the compass, complete the links of the occult chain which bind all these Forces or motions together.

These discoveries have generated the great idea of *Unity of Force.* The inferior and subordinate motions of matter, which we are at present permitted to analyze, are but the fragments into which the One Universal

Agent has been, as it were, prismatically broken. Molecular organization is the *material substratum* through which this wonderful subdivision is effected. When we are tracing this same wonderful force through its different manifestations, we are reminded of the mythical story of Proteus, who was constantly eluding his pursuers by changing his shape. Faraday, as early as 1845, in his Bakerian lecture, gave a decisive opinion in favor of these speculations: "I have long held an opinion, almost amounting to conviction; in common, I believe, with many other lovers of natural knowledge, that the various forms under which the Forces of matter are made manifest, have one common origin; or, in other words, are so directly related, and mutually dependant, that they are convertible, as it were, one into another, and possess equivalents of power in their action." The objects of future inquiry will therefore be, to define with the greatest accuracy, the mechanical and mathematical properties of each motion, and to ascertain the modes and laws of the conversion of each into the others. The suggestion has not failed to occur to many reasoning men, that in the course of our researches, we may discover new motions of matter, and coincidently new and astounding phenomena. Professor Grove remarks, "that other Forces may be discovered, differing as much from these as these differ from each other, is highly probable; and that when discovered, and their modes of action fully traced out, they will be found to be related *inter se*, and to these, just as these are to each other, I believe to be as far certain as certainty can be predicted of any future event."

The nature of the solar emanations, the position of the sun in the center of the planetary system, and its evident but mysterious connection with the sidereal heavens, warrant us in looking for some common center to all the undulatory forces of nature. The German language has appropriately given the feminine gender to the word "sun;" for, truly, it is the mother of all things, having created them of her substance, borne them in her bosom, and invested them with her properties. The nebular hypothesis, generally ascribed to La Place, but really proposed thirty years earlier by Swedenborg, plausibly maintains, that each planet was stricken off from the sun by a centrifugal force, at the period when the solar mass extended to or a little beyond the present orbit of that planet. Our globe is a miniature sun, as a nucleus is a miniature cell, a seed a miniature plant, or a fœtus a miniature man. Not that our earth will grow or develope into a sun, but it retains the motions and potentialities which existed in the circumference of the sun's disk, when that circumference was ruptured, conglomerated into a minor sphere, and commenced an independent motion. Accordingly, it has thrown off its own satellite, and a miniature earth revolves around it, and illumines its night. Accordingly, its central heat is so great, that most of our metals are liquid at the depth of five miles, only one eight hundreth of the distance to its center. It is in the mutual relations existing between the earth and the sun, that we are to look for the causes of all terrestrial phenomena.

The solar emanations have been subjected to prismatic analysis, by which we have discovered the lu-

minous, calorific, and tithonic or chemical rays. By the action of these upon the earth's crust, currents of Electricity and Magnetism are generated. Indeed, Sir John Herschel, in his Astronomy, Page 201, refers to the sun's ray as the ultimate source of Heat, Light, Electricity, Magnetism, geological changes, volcanic activity, chemical compositions and decompositions, and vegetable vivification. Thus, however generated or perpetuated, the *solar force* may be considered the aggregate expression for all the motions of matter; in fact, the motion, which by its descent, subdivision, or resolution into lower forms, generates all the manifestations of nature.

Passing now from physical to vital phenomena, we are not to hypothecate any new agent, until we have satisfactory evidence that we are not dealing with some modification of a known one. Such being the relation of forces on the grandest arenas of nature, we have no right *a priori* to anticipate any exceptions or special provisions in the sphere of Organic Life. The plant or animal, like the world itself, is an aggregate of molecules and motions, composed of the same material, and necessarily subject to the same laws. We should bring, therefore, to General Physiology, the principles and modes of reasoning, which we have adopted in the study of Natural and Chemical Philosophy. We are to see how far the Forces of organized bodies are mutually convertible, and ascertain, if possible, what relations they bear to the Forces around us, which are susceptible of more thorough and definite analysis.

Those Physiologists who have hitherto failed to recognize the convertibility of forces, have been obliged

to affirm that Vital Force exists in a dormant condition in all matter capable of becoming organized. Dr. Carpenter remarks, that there appears nothing illogical in this proposition, to those who have believed that a dormant magnetic power might be attributed to iron. But it is entirely unsatisfactory to those who not only deny the existence of any such thing as latent force, but denounce its supposition as an absurdity. When, therefore, organizable materials are converted into living structures, we are to endeavor, if possible, to trace the whole series of operations from some external agency.

We find that in the lowest form of the vegetable germ-cell, Heat and Light are required as specific stimuli, prior to the commencement of developement. Moreover, we find that the rate and extent of the developement is exactly proportioned to the amount of the luminous and calorific forces appropriated. "According to Boussingault," says Carpenter, "the same annual plant, in arriving at its period of development, and going through all the processes of flowering and maturation of its seed, every where receives the same amount of Solar Light and Heat, whether it be grown at the equator, or in the temperate zone; its whole period of growth being in a precisely inverse ratio to the amount it receives in any given time, and its rate of growth consequently in a direct ratio. Hence, it appears, that the organizing force of plants bears a relation of equivalence to the Heat and Light which act upon them." The agency of Light is particularly directed to the fixation of carbon in the vegetable structure, which is one reason why animals are com-

paratively independent of it. But the amount of carbon fixed is always in accordance with the degree of illumination they receive. The maturation of the seeds of plants, and of the eggs of insects, may be at pleasure retarded or accelerated by the mere regulation of temperature. And each individual of the same species receives the same amount of Heat, whether the intensity of its action be greater or less.

Dr. Edwards made some experiments upon the tadpole, which showed the dynamic agency of Light in organization. When excluded carefully from sunlight, and well supplied with aerated water and food, they grew to twice and even thrice their size as tad-poles, but underwent no metamorphosis into frogs. Mr. Higginbotham has recently made some experiments which seem at first sight to set aside Dr. Edwards' conclusions. He found that tad-poles were converted into frogs in the dark, when they were supplied with grass, and ate the chlorophyl adhering to the cells of the plant. Now the green part of vegetables are never represented in Daguerreotype images, evidently because some kind of undulations falling on them are not reflected. The formation of these images is well known to be due to the chemical rays of the sun. From these facts Matteucci draws the inference, that chlorophyl is only produced by the Tithonic or chemical rays. It may, therefore, be said to embody the dynamic power of that ray. Add to this the fact stated by Draper, that the chemical ray or undulation (for he shows its transmission to be identical with that of Light and Heat) excites or determines the arrangement of molcules into particular groups, so as to produce development. And

we now see, on the hypothesis of convertibility, that the frog in eating the chlorophyl appropriated the identical Force, which in the open air would have produced and secured his metamorphosis without the chlorophyl. This deduction, so apparently extravagant, is logically drawn from the premises.

The inference from these and a vast mass of similar facts, is that the external forces of nature, particularly Heat and Light, passing into organized structures, become converted into new manifestations of force, which we provisionally call assimilative, organizing, reproductive, etc. Chemical action and mechanical motion constitute the fundamental basis of all these processes. By the former, an extensive range of new compounds is generated, such as have never been imitated in the laboratory of man. Light and Heat are the forces which acting through the vegetable or animal cell, as their instrument or material substratum, produce those new chemical attractions which determine the formation of the new compound. In other words, a portion of the force known as Heat or Light ceases to exist as such, and is manifested in a modified form as chemical affinity, which again during the act of decomposition is reconverted into Heat or Light. These are elementary facts necessary to the conception of animal as well as vegetable heat.

Dr. Carpenter suggests in common with other distinguished physiologists, that all the phenomena of cell-growth are explicable on the hypothesis of convertibility of forces. The more obvious motions of animals are evidently dependent upon the nervous system. We shall hereafter see that voluntary muscular contraction

is a continuation of Nerve Force, but movements of plants and the analogous movements of some animal tissues, appear to be modifications of the Organic Force, a provisional name for a definite modification of Heat and Light. The simplest and most universal of these motions, are endosmose, a species of capillary attraction, and ciliary motion. Endosmose plays such an important part in the changes of all organic beings, that Matteucci, and other great philosophers, have made it the subject of special experiment. The motion is finally resolved into chemical attraction. But both the motion and chemical affinity can be shown to be remote modifications of Heat. Matteucci discovered, that the rate of the imbibition can be always accelerated or retarded by increasing or diminishing the temperature. Prof. Grove instances a beautiful experiment which has a bearing upon the point. He put hydrochloric and nitric acid respectively into the two compartments of a trough, separated by unglazed porcelain, asbestos, or some other porous material through which an endosmotic current might pass. No spontaneous current occurred. Into each part he thrust a gold wire, but still no action was produced. He then brought the free ends of the two wires together; a current of Electricity was immediately detected in the metals by the galvanometer, the endosmotic exchange between the two acids began, and the gold commenced to be dissolved by the liberated chlorine. The correlation between Electricity and Heat has been already pointed out, and Becquerel asserts, that Electricity is a constant attendant upon the phenomena of imbibition.

Ciliary motion, although seldom discoverable except

with the microscope, is common to plants and animals. The cilia which are minute hair-like filaments, varying from 1-1000th to 1-1200th of an inch in length, are found upon almost all the free surfaces of the human body. During life and for a variable period after death they are in a state of continual vibration, which strongly resembles the undulations of a field of corn. It has been fully demonstrated that they have no nervous or muscular connection with the rest of the body. Nothing seems absolutely indispensable to their activity, but the integrity and moisture of the epithelial cell to which they are attached. Dr. Carpenter thinks that this ciliary motion may be a partial expenditure of the Organic Force, derived by convertibility from the solar emanations. He considers this view to be remarkably confirmed by the fact, "that in the history of the zoospores of the Algae we have two distinct periods, one of ciliary action, and the other of growth and multiplication. So long as the ciliary action continues, no further vital change takes place in them: but so soon as this ceases and they become stationary, they begin to exercise chemico-vital transformations, and to grow and multiply as cells." The mechanical force thus passes into a chemical one, and in the higher orders of living beings, ciliary motion may still be the expression of the excess of chemical or organic force in the subjacent tissues.

From this point, we pass, by natural transition, to the contraction of involuntary muscles, which has been shown to be quite independant of any connection with the central nervous system. The inherent irritability of muscular fiber was taught by Haller, and although

keenly questioned by some great observers, may still be said to be the prevalent doctrine of the schools. But if the mutual convertibility of forces has any foundation in nature, this inherent or latent irritability is as unphilosophical as latent Heat or Light, or latent force of any kind. We must endeavor to show that the force which produces this contraction is not educed from the muscle—but transferred to it.

In one of Tiedemann's experiments, the heart of a frog taken entirely out of the body and suspended by itself in the air, continued in uninterrupted motion for more than an hour. Now it is contended by some that the peripheral nerve fibers distributed throughout the heart had not lost their excitability, and that they produced the contraction. But Bowman has caused a single muscular fiber separated from all other tissues, to contract under a stimulus—and even under such a stimulus as would not have excited its nerve at all. Therefore the Nerve Force is not *necessary* to muscular contraction. This is no more than every body admits, and does not prove that there must be no external force at all or that the contraction is spontaneous. When Tiedemann put a fresh heart under the exhausted receiver of an air pump, the pulsations became instantaneously weaker and slower, and ceased entirely in thirty seconds. He attributed this cessation to the withdrawal of oxygen. It is evident from this experiment alone, that if our process for isolating the muscular fiber from *all* extraneous sources of power could be rendered perfect, no contraction could possibly ensue. Under the pressure of three atmospheres the action is greatly exalted, and prolonged. The Heat and Elec-

tricity, developed by that operation pass into the muscular fiber and escape from it again as mechanical power during the contraction. The force which occasions the contraction is therefore always *transferred* to the fiber. Contraction is the only mode in which that force can act, for the cells which constitute muscular fibrillæ can undergo no modification but that of shape. They exercise no power of chemical transformation, undergo no histological changes, and appear to be entirely destitute of the power of self-multiplication. The expenditure of their vital force in the single act of contraction involves their death and disintegration. Their renewal is accomplished by the production of new cells from the myolemma, which itself possesses no contractibility. Every form of undulation or species of force passing into that medium *must* be given out again as mechanical power. In the living animal the Nerve Force is the one specially provided for conversion into this and all other manifestations of vital activity.

Having thus pointed out the essential identity of the Inorganic and Organic forces of nature, we are to take a step higher in the generalization, and show that the forces of Animal Life are but the more complex, and successive continuations of the causative powers we have just been considering. A living, actively moving spermatozoon comes into contact with an organic molecule, elaborated from the maternal blood, and deposited in an appropriate nidus. Immediately commences a most miraculous series of appropriations and compositions, so that, very soon, the amorphous material exhibits the definite outlines of bones, muscles, nerves, glands, and other tissues, all mysteriously but

symmetrically and beautifully woven together. The preparation of these organizing and organizable materials is attended with loss of Force to the parent; for in many of the lowest species of animated nature, reproduction is accomplished at the expense of the vitality of the individual, and in all, even man himself, it is attended with remarkable exhaustion. This force, together with the heat and forces of the blood derived from the mother, is broken up, or subdivided into all the vital affinities and molecular motions which occur in the parenchyma of the embryo. At birth, all the tissues are formed and the blood in circulation, and as soon as the lungs admit the atmospheric air, the nervous force, *vis nervosa*, becomes the single, universal and predominant power in the living economy.

We may safely venture to affirm that no system of Pathology or Therapeutics can be of real or permanent value, unless it has a broad and deep basis in a correct Physiology of the nervous system. It is upon this ground principally, that I claim for Homœopathy a theoretical as well as a practical superiority. I contend that the nerve-centers are the sources of all vital power—that their modification is the essential element in all disease—and that their re-adjustment as it were, is the rational end of all medication. I purpose to inquire whence this great Force is generated, what are its properties, and under what modified forms it is distributed among the various organs and tissues of the body. But for fear it may be supposed that I am indulging in some unwarranted speculations, without the high sanction of authority, I will make one or two quotations to show, that however my conclusions may

differ from theirs, my premises are approved by some of the first medical men of the age.

Professor Meigs, of the Jefferson College, in speaking of the nervous system, says, "Whether it be annelide or insect, a radiate, vertebrate, reptile, fish, bird, or mammal, the Ens, the living creature, that which can do, be, or suffer, is composed of the nervous mass of the creature, which is noble, and all the rest is vile, common, and of less account. It is for the conservation of this nervous Ens, as Oken denominates it, that its ministers and servants, the anatomical organs and histological tissues, are added to it as its endowments and properties. *It* is the seat and source of their vitality. They are regulated and maintained in a coordinate life, by *its* biotic force." And again, "the nervous mass makes the animal; of course the nervous mass makes the organs of the animal. In this sense the optic nerve makes the eye, another nerve makes the lungs, another nerve develops the liver and is the bile nerve, and so forth, to the entire edification and composition of the living, sentient animal. Is such an animal sick? Is any one of its organs sick? The nerve that composed and dominates that organ is sick. It is impossible to suppose that the organ can be sick through any other way; for the life of the organ is in the nervous mass of it, and it can not vary but with the varying forces or crasis of the same nervous mass." The idea couched in the last sentence will be appropriately expanded in the next chapter.

Again, Mr. Paget, in his admirable Lectures on Inflamation, gives a clue, which, for the benefit of Homœopathy I shall trace to its logical issue. "Now,

that the nervous force has some other influence in normal nutrition than can be explained by referring to it only the government of the size of the blood-vessels, we have, I think, ample evidence; and I can not but wonder at the steadfastness with which some maintain or imply that the nervous force can manifest itself in nothing but impressions on the mind, and muscular contractile force. So limited a view of the convertibility of nervous force, is such a one as the older electricians would have held, had they maintained that the only possible manifestations of electricity were the attractions and repulsions of light bodies, or that the electric force could never be made to appear in the form of magnetism, of chemical action, or of heat. We are too much shackled with these narrow dogmas of negation. The evidence of the correlation and mutual convertibility of the physical forces might lead us to anticipate a like variety of modes of manifestation for the nervous and other forces exercised in the living body. We might anticipate, too, that as the nervous force has its origin in the act of nutrition by which the nerve-substance is formed, so, by reciprocal action, its exercise might affect the nutritive acts. As (for illustration sake) the completed blood affects all the processes by which itself was formed, so, we might suppose, would the nervous force be able to affect all the acts of which itself is the highest product." With the substitution of the more positive word *effect* for *affect*, this paragraph might form the text for my theory of function.

How is the Nerve Force generated? Absorption, nutrition, secretion, aeration, muscular motion, and in-

nervation—all the most complicated dynamic actions of living beings—are performed through a common instrumentality, the simple organic cell. The more vital the functions of a part, the less is the deviation from the original cellular constitution of animal matter. Bone, serous and cellular tissue, skin, and aponeurosis, have all very greatly departed from their elementary forms. But the cells of the glands, of the muscles, and of the nervous mass, retain their isolated state, and terminate their individual lives by executing a special function. This remarkable uniformity of cell-action has been cited by some physiologists as one link in the chain of evidence—"that all the truly vital phenomena, however diversified, are but results of the operation of one and the same Force, whose particular manifestations are determined by the nature of the material substratum through which it acts; the same fundamental agency producing simple growth in one case, transformation in another, multiplication in the third, mechanical movement in a fourth, whilst in a fifth it develops nervous power, which may itself operate in a variety of different modes."

Neurine, which is the technical term for nervous matter, is of two kinds, the *vesicular* and the *tubular*. The first is of a gray or ash color and pulpy texture, and has been found by the microscope to consist of nucleated cells or vesicles. The latter is of a pearly white color and fibrous texture. It is now universally conceded that the peculiar power of the nervous system lies in the vesicular or cineritious portion. It is positive, while the tubular portion is merely negative; the one is a generator, the other only a conductor of what

we call the Nerve Force Solly and others have aptly compared the vesicular neurine to the secreting cells of a gland. It eliminates, in some manner to us inscrutible, a Force from the blood, just as the nucleated cells of the liver or testicle eliminate new and different organic materials from the same substance. Vesicular neurine is entirely useless without the blood, and the tubular is equally so without the vesicular. The tubular has been compared to the efferent ducts of the glandular structures, being evidently designed to convey something from one point to another. It is connected with the vesicular immediately, as the heart is with its vessels; although there is no evidence that the vesicles are hollow like the heart, and have like it a systole and diastole, by which a subtile fluid is circulated, as was extensively believed in the last century. The *neurilemma*, a membranous sheath, insulates the nerve proper, even to its finest filaments. This still further consists of an opaque cylindrical thread, called the *white substance* of *Schwann*, within which is a fine central rod or line of transparent matter, the *axis-cylinder*, and probably the true conducting material. The vesicles or nerve centers are frequently connected together by tubular threads, which are called *commissures*. Such is an outline of the structures, whose functions we are to investigate.

The Nerve Force is generated by the reactions which occur between the vesicular neurine, and arterial blood. In other words, it is eliminated from the blood by a structure designed for that specific office. All the inferior phases of organization, are but preparatory measures to collect and elaborate a material for the

conveyance of Force to the nerve-centers. The vegetable has the mineral kingdom for its basis—the animal has the vegetable. The blood is a mixture of mineral and vegetable matter, and the prime cause and basis of all the operations of the nevous system. Dr. Todd has compared that system to a galvanic battery, of which the blood is the exciting acid. But it must not be forgotten that the battery itself is made out of the material which excites it. The blood may be imaginatively, but nevertheless truthfully called a solution of Organic Force. It is moreover a carrier of iron and oxygen, the two most remarkable of all the elementary substances. The mode of its operation on the nerve-centers is the most complex, and probably the sublimest question which can be submitted to the analytic powers of man. We have seen what a vast amount of Force as well as material is embodied in the tissues of plants. This is liberated from the prison-house of organic texture by the subtile and solvent powers of saliva, gastric juice, and bile—substances requiring for their own elaboration from the blood, considerable transformation of the Nerve Force. The Force which binds the molecules of a substance chemically together must be rendered up when that substance is decomposed. When a dimorphous crystal changes, spontaneously to all appearance, from one form to another, a flash of light is frequently perceptible. There can be no molecular motion without the development or evolution of Force. The processes of hæmatosis may be said metaphorically, to divide the food of an animal into a soul and a body; the soul is the liberated Force which the vesicular neurine appropriates and transmutes into the Nerve

Force by transmission through its organic media; the body is the organizable material of the blood, which goes to the constant reconstruction of the tissues.

The iron of the blood exists in combination with hæmatin as an integral constituent, as iodine occurs in sponge. This connection is so intimate that Mulder denies that iron is at all concerned in the chemical changes of respiration. He is mereover inclined to think that it exists in a permanently metallic state. The idea is strongly supported by the evolution of hydrogen from hæmatin, which has been treated with sulphuric acid and water—the sulphate of the protoxide of iron being formed. When we reflect on the magnetic properties of iron, and its simultaneous subjection in the blood to heat, moisture, electricity, and chemical excitation, we may get an idea of the vast field of research and discovery, which we must explore, before we can understand its physiological use and its modus operandi. Oxygen, under the hypothesis of convertibility, becomes the most energetic medium of transference in nature. I can not but think that its office in the animal economy has been too closely limited to its chemical reactions with the elements of the blood. It is mysteriously connected with Electricity, and Faraday has succeeded in rendering it highly magnetic. The blood is a carrier of oxygen to all the tissues equally, but the reactions which occur depend upon the forms of the tissue. "Nothing lives," says Dr. Meigs, "save in the presence of oxygen. It is even true, that the spiritual soul being present, all life is the result of a process of oxygenation. Hydrogen, azote, chlorine, carbonic acid, neither evolve nor sustain life. Oxygen

is the vitalizing, not the vital principle. It is the cosmic agent for producing vitality out of nervous mass."

The fact, that a powerful Force originates in the nerve-centers, and passes towards the peripheries like Electricity along a wire, is as well established as any fact in physical science. That it pre-existed in some form in the blood, is to me an irresistible inference. And if it pre-existed in the blood, it pre-existed in the food—of which the blood is only a modification. And if it pre-existed in the food it pre-existed in the inanimate kingdoms of nature. It is therefore, like all Force, nothing but matter in motion; but it is animal matter, and consequently the results of its motion are new and surprising. And according to the great doctrine of the essential unity of Force, we expect to find it intimately connected with the better known and simpler Forces of the inorganic world. The questions, how is it generated from the blood, and how is it modified by the spiritual or psychical element of our being, we may never be able to answer. We need not be detained where speculation would be almost useless, but may pass on to the consideration of the Nerve Force itself, its analogies, and its different manifestations.

The Nerve Force is more intimately correlated with Electricity than with any other motion of matter. Electricity made to traverse a motory nerve is converted into Mechanical Power in the muscles to which it is distributed. Applied to a sensory nerve it produces the special sensation of the nerve, Light in the optic, sound in the auditory, taste in the gustatory, and smell in the olfactory. Conversely, the Nerve Force can excite or be transformed into Electricity. The

operation of the electric organs of the Gymnotus and Torpedo has been fully proved to depend upon their connection with the nervous centers, and to vary in intensity with the degree of that connection. Moreover, Matteucci, after many experiments, has arrived at the conclusion, that muscular contraction is attended by an evolution of Electricity, or, as he expresses it, "by an electric disequilibrium." But although thus remarkably correlated, they are not identical. Electricity, indeed, may be made to simulate the Nerve Force to a wonderful extent. By the aid of the blood it may carry on nutrition or secretion in a paralyzed limb or a separated organ. But Matteucci positively decides that the electric current does not exist naturally in the nerve of a living animal. The laws of its propagation require conditions, which are not found fulfilled in the nervous system. The propagation of the Nerve Force is interrupted by causes which would not produce a similar effect upon the electric current.

But Heat also when applied to motor nerves will produce motion, and to sensory nerves, sensations of all kinds. On the other hand, the Nerve Force may be converted into Heat, as we shall presently see. Light produces Nerve Force, and correlatively Nerve Force may assume the form of Light. This is seen in the curious luminosity of some marine worms, which seems to bear a closer analogy to the discharge of the electric organs of fishes than to common phosphorescence, which is apparently a slow combustion. Quatrefage, who has studied closely the phosporescence of the Annelides and Ophiurae, describes it as being produced during the contraction of muscular fiber, and as entirely dependent on

the nervous system. Mechanical irritation is known to call the endowments of any particular nerve into activity. But this mechanical irritation, as Dr. Carpenter observes, is nothing but a motion of the particles or molecules of the nerve-trunk. That admirable Physiologist thus continues the discussion of the subject: "It may be said, however, that the nervous force does not produce motion, since it merely acts as a stimulus upon the muscular substance, in which the motor power really exists in the dormant state. And this objection, plausible enough at first sight, might lead us still further to consider, whether the *vis musculosa* is not as nearly related as the *vis nervosa* to the agencies in question. For we find that muscular contraction may be excited, not only by the nervous force, but also by Electricity, Heat, chemical agents, or mechanical irritation, applied to the muscle itself. All these influences are said to *stimulate* the muscle to contraction, but are they anything else than the forces which, in a changed condition, become the contractile force of the muscle?—just as, in Professor Good's view, impeded motion becomes Heat or Electricity, according as the friction takes place between similar or dissimilar substances."

The Nerve Force is apparently of a much higher and more complicated character than any of the Physical Forces with which we have been comparing it. It may be called analogically, the *solar force vitalized*. It is the subtlest and most powerful form under which the One Universal Force manifests itself. But after all, it is to be remembered, that it is only the force of inorganic nature raised, like an algebraic expression, to a higher power. It is matter in motion, and as such, susceptible

of conversion into other and more familiar forms of motion. It is resolvable into Heat, Light, Electricity, Magnetism, Chemical Action, and Mechanical Power. Upon its modes and manifestations, therefore, all the phenomena of living bodies, in health or disease, depend.

It being conceded, that vesicular neurine extracts or secretes Force from the blood, the question arises, is there no other organic tissue which executes a similar office? The physiological answer is, none. All the tissues draw their structural elements from the blood, but their Force or vitality can be demonstrated to come from their incident nerves. The use of the blood may be succinctly defined to be, to convey Force to the nerve centers, and to furnish material to the organic peripheries. If the blood was the carrier of Force to the various organs of the body, the functions of the nervous system, which may be said to constitute the entire *animal*, could be reduced to zero. As Electricity, Heat, or Magnetism, are transferred to some substances in preference to others, so the organic substance neurine, is the only conductor of the Force which is transferred from the blood. And further, this Force can not be transferred *as such* from the nerves to any tissue, (with perhaps a single exception) but must be broken as it were into fragments, which, if reunited, would always be dynamically equivalent to the original Force.

An objection to this theory of the passivity of the blood, in contradistinction to the common one of its inherent chemical life, might be apparently supported by the following fact. When a ligature is applied to a large arterial trunk in the human body, there is not

only a deficiency of sensibility in the surface, but also a partial or complete suspension of muscular power, until the collateral circulation is freely established. Thus the interruption of arterial blood is almost equivalent in effect to an interruption of the nervous current. And in the case under consideration, there is a real interruption of the nervous current, almost as positive as if the ligature had been applied to the nerve instead of to the artery. For the axis-cylinder, or central portion of the nerve filament, is the conducting medium of the Nerve Force, and is deposited like every other tissue from the accompanying arteries. Its integrity is just as essential to nervous action as the iron track is to the motion of the locomotive. The arrest of its nutrition or constant renewal, accounts for all the phenomena. And this view is confirmed by the fact, that when the collateral circulation is established and the nutrition of the nerve trunk thereby rendered regular and normal, both sensibility and the power of motion return.

"The nervous force," says Dr. Radclyffe Hall, "can stimulate every living molecule endowed with a certain function, to the more active discharge of that function. It can consequently excite, variously modify, and greatly derange all vital actions. Muscular contraction, cell-metamorphosis, the evolution of animal heat, are influenced by the nerves in precisely the same manner, the difference in result being due to inherent differences of vital endowment in the molecule subjected to the nervous influence." When will the medical profession get rid of these vague and incomprehensible "vital endowments" and forces to *stimulate* them? What

conception can a mind, accustomed to consider Force as matter in motion, form of "the inherent vital endowment" of a living molecule? For what reason and in what manner is it dormant? And is the Nerve Force, so wonderfully and elaborately prepared by organs which are the chef-d'œuvres of anatomical structure, the mere prick of a needle to rouse the sleeping organic potentiality into action? How much more simple and philosophical it is, to suppose that physiological differences depend on differences of molecular arrangement or organization of parts; and that the function of a molecule is the form which the Nerve Force assumes in passing through that molecule, whether it be a change of constitution or a change of place, a chemical or a mechanical action.

It is very difficult for us to divest ourselves of the mere verbality of the text books, and look upon the Force which we call Chemical Affinity, as an undulatory condition of molecular matter. Until this is done, however, we can not comprehend how the Nerve Force is converted into chemical action. There are two great facts in physical nature, which will aid our conception of the subject. What we call the chemical properties of even an elementary substance, depend upon, or are the results of a definite arrangement of the molecules which constitute the substance. Chemical Force is no property which belongs inherently to the substance, but comes and goes, is apparent or quiescent, with the change of atomic juxtaposition. It was once supposed, that pure and dry oxygen gas had certain fixed and inalienable properties, which could only be modified by combination with some other element. But when a

series of electric sparks are passed through it, by which a vibratory motion is communicated to its molecules, the oxygen assumes unexpected properties, acquiring a penetrating and nauseous odor, and a power of liberating iodine from iodide of potassium, becoming at the same time the most powerfully bleaching, deodorising, and disinfecting agent in nature; indeed it is no longer oxygen. Berzelius, Dumas, Faraday, Schönbein, and Draper, have shown that almost all the elementary substances may be made to assume these allotropic states in which their properties are completely altered. For a thorough survey of this interesting subject, see a critique on the Present State of Chemical Philosophy, in the British and Foreign Medico-Chirurgical Review, April, 1848.

The other fact, equally demonstrable and more significant, is, that the prismatic analysis of the solar ray gives a series of undulations, which have been called Tithonic, Chemical, or Actinic. These are not Heat, nor Light, nor Electricity, but undulations which pass into substances, modify their molecular arrangement, and produce the phenomena which we call chemical actions. The evidence that chemical action is an undulation of molecular matter, is just the same as that which defines Heat and Light to be such undulations. And if the Force was aught but matter in motion, it could not be so readily converted into the other forms of molecular motion, more susceptible of mathematical analysis. The undulations of Heat, Light, or Electricity, passing into a material substratum or medium, are modified or converted into the undulations of Tithonism or Actinism, and we have chemical instead of calorific,

luminous, or electric phenomena. This fundamental principle pervades all the kingdoms of nature, mineral, vegetable, and animal. The Oxygen, Hydrogen, Carbon, and Nitrogen, which form the plastic material of the blood, have no inherent chemical affinities, by which gastric juice, bile, muscle, and nerve-tissue are produced. The molecular motions, which cause or produce such affinities, are communicated from the Nerve Force.

Some writers, bringing the facts of vegetable Physiology to interpret phenomena in which all the circumstances of vegetable life are not present, and in which other and novel circumstances are present, contend that although the nervous system may exercise a modifying influence over the several tissues, their formative activity is not derived from it. The independent vitality of the elementary cells is the basis of this opinion. These cells are distinct individuals, having their birth, growth, function, reproduction of species, and death. They are common to both plants and animals. But as in all other cases, their so called vitality must be *derived*. If they could be shut out from all undulations impinging upon their surfaces, they would be dormant forever like the seeds in an Egyptian mummy. The chemical changes of vegetable cells are known to be due to the action of the sun. Put a fresh green leaf into water exposed to sunlight, and oxygen gas will escape from its surface in bubbles. Shade it and the disengagement of gas immediately ceases. The greater the force of the sun's ray, the greater the speed at which the vegetable machinery is driven. The sap and epithelial cells of the plant correspond to the blood and the epithelial cells of the animal. But the tissues of

the animal are involuted, and turned from the sunlight instead of being expanded towards it. There is no evidence that in Animal Physiology, there is any direct conversion of Heat and Light into Organic Force, as in the vegetable world. In the strictest sense, indeed, Organic Force is a provisional name. Organic phenomena, produced by solar undulations in vegetable tissues, are the real objects of our study. If the Physiologist would transfer the idea of Organic Force derived from vegetable phenomena unmodified to animal bodies, he must concomitantly prove that the chemical actions of the lungs, the skin, or the liver, are directly caused by sunlight. The great similarity of the organic process in the two cases has led him to assign to both, the same vague and undefinable cause. This similarity only proves the intimate correlation of the Nerve Force with the undulatory Forces of the physical world. The Organic force of animals is a modification of the Nerve Force, just as the Organic Force of plants is a modification of the Solar Force.

Having premised thus much with respect to the true nature of chemical action, it will be sufficient to cite, by way of illustration, a few examples of the relation which the Nerve Force bears to the chemical process of nutrition. Mental operations are known to be connected with and based upon molecular changes in the vesicular neurine. By the impressions made upon these centers through mental media, and which belong to the province of Psychology, not only the motions of the heart, lungs, and intestines, but the secretion of tears, saliva, milk, bile, sweat, semen, and urine, may be augmented or diminished and otherwise rendered

abnormal. A mother's milk even, through the nervous system alone, without adding to or abstracting a single element from the blood, may be made as poisonous as hemlock or corrosive sublimate. Defective nutrition often follows injuries of the spinal cord and general atrophy is a frequent consequence of a disease of the brain.

Mr. Paget cites a case which shows beautifully the action of the Nerve Force, in the nutritive process. A man presented himself at Guy's Hospital, who in consequence of a fracture at the lower end of the radius, repaired by an excessive quantity of new bone, suffered from compression of the median nerve. There was an ulceration of the thumb and fore and middle fingers, only the parts supplied by that particular nerve, which resisted every method of treatment. The wrist was bound forward in such a manner as to remove the pressure from the nerve, and permit the regular supply of Nerve Force. The ulcers speedily healed, and perfect nutrition went on in the fingers so long as the nerve was kept free, but afterwards whenever the man was allowed to use his hand, the ulcerations returned.

A remarkable example of the nervous government of secretion may be found in the Archives Gènèrales for May, 1849. M. Bernard discovered that the urine may be modified and made to contain sugar by puncturing a certain part of the floor of the fourth ventricle of the brain. The change takes place in less than two hours after the operation. Repetitions of this experiment have demonstrated, that the portion which it is necessary to wound, to produce this curious result, is a point corresponding with the origin of the pneumo-

gastric nerves. It would thus appear to act by modifying the course of the chemical processes going on in the chylopoietic viscera. This example moreover shows how inextricably the tissues of the body are woven together, so that the chemical actions of one part depend immediately upon the due innervation of another.

The secretion of urine was constantly and entirely arrested by section of the renal nerves, in repeated experiments made by Muller and Peipers, although the normal supply of blood was distributed to the kidney. The former distinguished authority gives an opinion in favor of the old doctrine of chemical organic action, but with a qualification which is a virtual surrender of his own position. "I am far from believing," says he, "that the power of chemical action, which the glandular substance owes to its vital condition, (?) has not as equally important a share as the nervous influence in the process of secretion, but it is probable that *the influence of the nerves is necessary for the support of this chemical action*, which in each gland is different."

The Nerve Force is therefore the power which constructs the animal body out of the amorphous materials present in the blood. Much of its potentiality is expended in these chemical combinations. But it does not stop there. A Force at rest is no force at all. There is a continual waste which makes way for a continual supply. Disintegration is the attendant upon all acts of composition. The Force which binds molecules together in a certain form is liberated when that form is broken up. The new form which the same Force then assumes, is, in the circumstances we are

now considering called Animal Heat. Nerve Force therefore, having passed through the intermediate stage of Chemical Power, reappears and is radiated into the external world under the form of Heat. Animal Heat is just as surely a modification of the Nerve Force, as a gland or a muscle is a modification of the blood.

With a due supply of food and oxygen an animal can resist the most astonishing reduction of external temperature, a feat of which no vegetable tissue is capable. Animal Heat is increased by the exciting and diminished by the depressing passions. It is lessened also in sleep. A paralyzed limb is colder than one not paralyzed. On electrifying such a part, which is but giving it a tolerable substitute for the Nerve Force, its temperature rises. When the nerve centers are removed the body cools rapidly, notwithstanding the artificial maintainance of respiration and circulation. This view of Animal Heat as Nerve Force reproduced in another form, does not undervalue or gainsay a single fact discovered by Liebig and other Physiologists of the Chemical School. Chemical Action is still the connecting link. There is a constant ratio between the quantity of material consumed and the degree of Heat liberated. Animal Heat is still the product of an interstitial combustion.

Mechanical Power is the name which we give to the impetus or force with which a molecule or molecules move in space, whether the resultant of that motion be as magnificent as that of the earth rolling in its orbit, or as infinitesimal as that of a muscular cell. This force overcomes what is called the inertia of bodies, the

influence of gravitation, or the attraction of masses, atmospheric pressure, etc. In the animal body this is effected by the contraction of muscular fiber, which is only a certain change of place in its component molecules. This is always the last result of an analysis of those complicated motions by which the blood is circulated, the thorax expanded, and the bones moved one upon another, so as to cause all the varieties of locomotion. Nor do we here desert our fundamental idea of Force as matter in motion. The old doctrine, that muscular fiber possesses an inherent contractibility which is stimulated to action by the Nerve Force, is a mere circumlocution which only states without explaining the facts of the case. Of inherent properties we can form no conception, and therefore abandon the phrase as unphilosophical. Molecules have no spontaneous motions, and every change of structure must be caused by undulations emanating from some source. We have described an organic medium to the best of our ability, when we have described the manner in which it receives, transmits, or modifies the various undulatory Forces of Nature. Muscular fiber is an organic medium for the reception and conversion of the Nerve Force into mechanical power.

When a nerve is divided, the muscles to which it was distributed no longer contract, are gradually atrophied, or become subject to fatty degeneration, while there is a marked diminution of interstitial heat, even although the part be plentifully supplied with arterial blood. On the other hand, the amount of heat, chemical action, and mechanical force is exactly proportioned to and regulated by the degree of innervation.

Liebig long ago suggested that the disintegration of muscular tissue, resulting from the action of Oxygen upon its chemical elements, was the real source of mechanical power, by setting at liberty the Vital Force, as he terms it, which was previously employed in holding together the components of the structure. This is the origin, which, with a little modification, I have ascribed to Animal Heat. But if chemical action be converted into muscular motion, it seems to me that the motion must be as constant as the chemical action, which is by no means the case in the voluntary muscles. It is not enough to reply that the liberated Force accumulates until an explosive discharge of it is produced by the action of the will. Where, how, or under what form does or can it accumulate? Our doctrine of convertibility gives a much more rational explanation.

In a muscle at rest, it may be supposed that the ordinary nutrition proceeds as in other structures, the Nerve Force being converted into Chemical Affinity, and then into Animal Heat. But when a voluntary movement occurs, there is a new accession of Force from the brain. It is certain that the Will, whether it be conscious or automatic, can, within very wide limits, determine the amount of Force taken from the blood for the voluntary muscles. This accession is resolved into the mechanical force of contraction, probably through the medium of Electricity, just as Animal Heat is produced from the Nerve Force, through the medium of Chemical Action. The amount of Force thus expended is sometimes enormous. Violent exercise, by taking more than the allotted share for voluntary life, enfeebles the action of the heart, and

of the organs which are concerned in what are called the organic processes. Sleep and food are the great restoratives. The involuntary apparatus of life must work without intermission. A supply of Nerve Force must be ensured to it by anatomical and physiological provisions. And it is probable that sleep is enforced upon us by the fatigue, diminished action, and malaise produced, when the voluntary begins to encroach upon the reserve forces of the involuntary system. In the infantile form, so much Force is required for the nutritive processes during growth, that but little is left for voluntary actions, and, therefore, very small children are almost continually asleep. This vital condition becomes gradually modified until it is the very reverse in old age. This, of course, applies only to physiological sleep, for other elements are brought into the question, when we consider the sleep produced by injuries, by diseases, by drugs, or by magnetism.

It would be deeply interesting to survey minutely and analytically the motions of the heart and lungs from this new stand-point, to adduce confirmatory facts, and explain apparent anomalies; but it would lead into a difficult and extensive field of inquiry, which has but little bearing upon the main subject of the present treatise. A definite amount of Nerve Force, according to the principles already enunciated, is converted into the mechanical powers of respiration and circulation. The Force of all the molecular muscular motions produced is dynamically equal to the Nerve Force employed. And the sum of all the forms of Force into which the Nerve Force is resolved in its passage through the organic peripheries, is equivalent to the entire Force

eliminated from the blood by the vesicular neurine. This is the analogue in a higher field of the fact, that the waste is equal to the supply, or that the ingesta and egesta are chemically or materially equivalent. Thus there is a perpetual circulation, not only of matter, but of Forces from the inorganic through the vegetable and animal back again into the inorganic kingdom.

One of the most curious and important deductions from this doctrine of the priority, superiority, and convertibility of the Nerve Force, is a neural theory of animal reproduction. Its truth or falsity can not, indeed, materially affect the stability of the main theorem. The whole science of Embryology is too imperfect for us to make any positive and logical induction upon its assumed principles and phenomena. But it promises to be such an important arm of General Physiology, that every systematic attempt to penetrate its arcana is laudable, and may be valuable, if not by discovery, at least by suggestion. It appears to me that something useful may be elicited by transferring to this field of investigation, the general principles of the essential unity, correlation, and convertibility of Forces. But, as this is rather an episode than an essential part of my subject, I will limit my inquiry to the reactions which take place between the spermatozoon and the ovule in the higher animals, leaving to my readers, or to my own future opportunities, the comparison of the hypothesis with the principles which are to be deduced from a more general survey of the phenomena of reproduction, both in the animal and vegetable kingdom.

The last and highest act of vitality in any individual, plant or animal, is the production of an organic substance, capable of beginning in a new individual, the wonderful circle of phenomena which characterized the life of the parent. To secure this effect, there are two coincident actions — the elaboration of an ovule or organic cell by the female, and the impinging upon that cell of another cell, the spermatozoon, secreted by the male. The presence of this latter is as indispensible as the presence of Light for the chemical changes of a leaf. The *modus operandi* of the spermatozoon is shrouded in almost impenetrable mystery, so that a very wide range is given for plausible speculation. The common doctrine with respect to its action is, that it gives the initiatory *stimulus* to the organic processes of the ovule. But we have already established the principle, based broadly and deeply on the facts of natural science, that stimulus means really a transference of Force. The spermatozoon is therefore the positive and the ovule the negative element of embryonic development, just as the Nerve Force is the positive and the blood the negative element of the adult body. The one is organizing, the other is organizable; the material structure is the result of their co-operation. The female furnishes the negative initiatory material, the male furnishes the positive initiatory Force of the new being.

But Force is not an ideality. It is definite motion in a material medium, capable of passing by radiation or conduction into other and particularly into similar media. Now, what kind of undulatory motion can the male transfer to his offspring? Not Heat, Light, Actinism, or Electricity. When they pass out of him

into the external world, they are just as truly *excretions* as the sweat, the fæces and the urine. But the spermatozoon is a secretion, it is vitalized matter in motion. As the pollen is the specific form for the embodiment and transference of Organic Force from plant to plant, so, I would suggest, is the spermatozoon an organic embodiment of the Nerve Force of the animal. We have thus a sufficient cause for the organization of the ovule. I need not dwell upon the influence of the cerebellum over the generative functions, which the pathological researches of Gall, Vimont, Broussais, and others, have sufficiently established. If the secretions, as I have endeavored to show, be but modifications of the Nerve Force, then is the secretion of semen the most remarkable of all. It is rather a division of the Nerve Force—a kind of fissiparous reproduction of the nerve-animal itself.

The spermatozoon, indeed, presents the anatomical appearance of a nerve-vesicle and its filamentary appendage. And it is not improbable that the infinitesimal motions going on in its globular portion, have the precise mathematical character of those which occur in the vesicular neurine, so that by it not only physical peculiarities, but hereditary diseases, are transferred materially from parent to offspring. It will be in vain objected that Count Zuminski has discovered in the antheridia of various tribes of Cryptogamia, bodies bearing the most extraordinary analogy to the spermatozoa of animals. This no more proves that these bodies are carriers of Nerve Force, or that spermatozoa are *not* carriers of Nerve Force, than the fact, that a comet is composed of a nucleus and a caudal appendage,

proves it to be related in any manner to either of the organic forms in question. As we approach the starting point of all organization, the traces of individuality are successively obliterated. At their first appearance in the embryo, the testes of the male and the ovaria of the female are precisely similar. Moreover, the cellular constitution, the growth by nuclei and nucleoli, and the division of cell-walls into laminae, are common to the initial stages of all organic matter. But these elementary forms, physically identical, vary indefinitely in their subsequent development, and the diversity of development depends upon the diversity of the Forces, of which they become the media.

Let us then suppose the spermatozoon to be an offshoot from the nervous system planted in an ovule prepared by the female. Its cells may possibly be multiplied like those of the simplest vegetable structures, the Protococcus Nivalis, for instance, by simple sub-division and in countless numbers, the material of increase being furnished by the maternal apparatus. We know that at a later period, the myriads of nerve-vesicles in the cranial mass are developed by continued subdivisions from a few elementary nerve-cells. And there is no difficulty in conceiving all the vesicular neurine of an embryo to be thus developed from our hypothetical nerve-cell, embedded probably beyond the reach of the microscope in the body of the spermatozoon. Prevost and Dumas supposed that the spermatozoon was received by a fissure into the substance of the ovum or egg. But Mr. Newport, in some recent researches into the impregnation of the ovum in amphibia, has discovered that it never penetrates beyond the outer lamina. Du-

ration of contact, diffluence of the spermatozoon, and endosmosis of its contents into that lamina, are requisite for fruitful impregnation. Now, according to our hypothesis, what tissues ought to begin to be constructed in this external lamina prior to any other? Evidently, the nervous system and its appendages.

I translate verbatim from Marchessaux's Nouveau Manuel D'Anatomie Gènèrale, page 11—a treatise of much value. "At this stage of development we notice a fact, which confirms with irresistible power the doctrine of the centripetal succession of organs. Each one of these germinating sacs consist of three layers or laminæ, differing in nature. Of these the external or *serous* always begins to organize first, and from it arise successively the spinal cord, brain, vertebræ, cranium, the organs of sense and their dependencies. When the external lamina has thus sketched out the forms of the organs of animal life, the middle or *vascular* lamina commences in its turn, and in a similar manner marks the outlines of the peripheral vessels, the venae cavae, the aorta, and the heart. Up to this period the internal or *mucous* lamina has been inactive, but now its movement begins, and we see it successively delineate the alimentary canal, the lungs, the liver, the spleen, the pancreas, etc. This order is invariable: not only upon one occasion, but universally does nature proceed in this manner." This is given as part of a resumè of the vast embryological researches of Serres and St. Hilaire. A perfectly accordant sketch of these phenomena has been more recently made by Professor Agassiz in his Lectures on Comparative Embryology, p. 98–101.

What is there then to prevent us from believing, that

the creation of organs in the embryo is precisely identical with the nutrition of organs in the adult, by the transmutation of the Nerve Force into its correlated forces? The unquestionable fact, that many fœtuses have been born, with the thoracic and abdominal viscera properly developed, while the nerve-centers are either wholly or partially absent. This has been supposed to prove beyond a doubt that the viscera are developed independently of the nervous system. And nothing has contributed more than this idea to the forcible separation of vital phenomena into Animal and Organic. For if the development of an organ from an amorphous material takes place without nervous agency, its subsequent nutrition may certainly be carried on independently of it. But the objection apparently so formidable seems to disappear on a nearer scrutiny. I will not dwell upon some anomalies which might be gathered from medical literature, because they are greatly outnumbered by cases which prove that the peripheral always precedes the central formation. That one, however, of a fœtus, possessing a perfect brain and no spinal marrow, published by Mr. Grabb, and commented on by Dr. Tyler Smith, in the London Lancet, October, 1848, certainly does offer no slight embarrassment to the accepted laws of development. But I am entirely willing to concede, that the peripheral always precede the central formations in the serous, vascular, and mucous laminæ respectively. This does not still prove to us conclusively that the Nerve Force was not the sole creative agent. I can not be legitimately driven from my hypothesis, until a heart, liver, or other viscus is discovered normally developed, and yet without a trace

of nerve substance of any kind in its parenchyma, detectable by the highest powers of the microscope. Such evidence alone will prove that embryonic development is a synthesis and not a prismatic analysis of the Nerve Force.

The process may be supposed to take place in the following manner: The original spermatozootic cell reproduces, by assimilation from the surrounding amorphous material, a vast number of similar cells with their caudal or filamentary appendages of tubular neurine. These occupy the points which will afterwards be occupied by the various peripheric organs. The cells are *provisional* centers and act independently like the segmentary centers in the Hetero-Gangliata. They eliminate Nerve Force from the maternal blood, and construct the tissue at the terminus of their tubes or nerve trunks just as in the adult body. The growth or extension towards the central axis is effected by the successive addition of cells, like beads attached to beads, the last bead or cell formed being the provisional center of that thread, and the remaining cells running togegether by coalescence into tubes as in the case of arteries. Thus each nerve is separately constructed, and they all converge simultaneously towards the cerebro-spinal axis. They do not however reach that axis simultaneously, fer the spinal centers appear before the cranial. A total arrest of development would give us no centers at all on the median line: a partial arrest might give us a spinal cord and no brain, or as in the anomalous case, a brain and no spinal cord. The development of the vascular and mucous laminæ would go along *pari passu* with that of the nervous system,

and be caused and maintained by it. The action of provisional media, which disappear entirely when their use is fulfilled, is well recognized in General and Special Physiology.

This theory is corroborated by many facts in Embryogeny. The motion of the blood begins in the vascular area of the middle lamina, some time before the formation of the heart. This motion is from the periphery towards the center, afterwards occupied by the heart. Nothing so fully and consistently accounts for this motion, as the transmutation of Nerve Force from a provisional center. These provisional centers are to the capillaries what the cardiac centers are subsequently to the heart itself. For another interesting fact, I am indebted to Marchessaux. The three laminæ of the embryo display successively an exaggerated state of formative activity. This does not begin in the lowest on the vital scale and proceed to the highest, as would be anticipated in a transformation of organic into animal force, but the order is exactly the reverse. The spinal cord is at first disproportionately developed, protruding far beyond the bony canal which can not close upon it. Subsequently, the formative excess, if I may so speak, is transferred from the spinal cord to the vascular lamina, and the heart grows so inordinately as to fill up almost the whole thoracic cavity. Just in the same proportion does the spinal cord decrease, thus furnishing another instance of the transference and convertibility of Force. After a little time the heart diminishes and the liver becomes enormously overgrown, so that the relative excess of the Nerve Force is still further transferred to the mucous lamina. Much

of this Force is diverted to make the other chylopoietic viscera, the lungs, etc.; but although the liver is thereby greatly reduced, it is still remarkably large at the period of birth. On an analogous principle, the Great Sympathetic Nerve is considerably developed in the thorax, before it can be scarcely said to exist at all in the abdomen, in which after death the greatest mass of it is found.

The perfect dual symmetry of the nervous system, and all its direct appendages, the bones, muscles and organs of sense, is well known. And the equally perfect dual symmetry of all the organs of the body, in their primitive condition, has been fully established by the microscope. The heart, lungs, liver, spleen, stomach, pancreas, bladder, uterus and intestines, were at first as beautifully symmetrical as the brain itself, consisting of two similar halves meeting on the median line. The structure of all these parts becomes afterward more or less modified by mutual interference and for special functions. But in their earliest states they betray the workmanship of a great Force, organizing amorphous material in a symmetrical manner. Solly, in his masterly work on the Human Brain, gives a fact in point, on the authority of M. Serres. Until the third month, the spinal cord of the human fœtus extends to the extremity of the coccyx, and appears as if it would elongate indefinitely as in serpents. The coccyx then consists of seven pieces like elementary spinal vertebræ. Curiously enough, at that period the cord suddenly shrinks up to the point at which it is found after birth, namely, opposite the second lumbar vertebra. Very soon after, the osseous structures of the coccyx, not only

cease developing, but the pieces coalesce, are reduced to four, and continue always in a rudimental state. Now, I conceive it to be impossible to account for this change, except by admitting, that the development of the coccyx was caused by and dependent upon the Nerve Force, a principle which we claim to be of universal application in the animal body.

This digression, which is but the rude outline of a vast and intricate subject, could be indefinitely extended, but Homœopathy might be entirely forgotten in the enthusiasm of physiological investigation. The theory has much, I believe, to hope from continued researches into embryonic neurology. Nerve Force is certainly derived from the blood, and there is no known substance which can eliminate it, but vesicular neurine. I can not conceive how a law can be universal, or indeed a law at all, which is not as applicable to the embryo as to the adult. Uniformity and simplicity are the great tests of natural truth. The blood, or the material basis of the embryo, is indubitably furnished by the mother; and my conjecture, that the Nerve Force, or constructive agent is imparted by the father, may prove in the hands of capable analysts, to be something more than a fanciful speculation.

We need only briefly consider the offices of that class of nerves called *afferent*, which convey impressions from the peripheries to the nerve-centers. Here, also, the old idea of *stimulation* must be superseded by that of transference of Force. This Force is never generated in the peripheries, but is transferred *ab extra* through the peripheries to the centers. The medium in all cases is very probably mechanical or chemical action. Thus

the luminous undulations, as suggested by Dr. Draper, excite in the delicate structures of the retina, specific chemical changes. Through these, as an intermediate link, the dynamic power of Light, ceasing to exist as such in the physical world, is propagated to the brain as a vibration of the optic nerves. How much of this Force is expended in making the mental impression, and in what manner, we can not imagine. But it is probable that much of the Force is returned by reflex action to the muscles of the eye. So that the delicate motions of the iris, and of all the adjusting agents in the occular apparatus, may be only modified manifestations of the Light which entered the pupil. "There can be no reasonable doubt," says Dr. Carpenter, "that the production of Nerve Force in the central organs, is dependent upon the development of the peculiar cells constituting the ganglionic or vesicular neurine; and, as already remarked, the progress of physiological inquiry seems to justify the belief, (long since entertained and expressed by the author), that either cells or cell-nuclei are the agents in the origination of Nerve Force, at the peripheral extremities of the nerve-fibers."

The afferent nerves may be very properly divided into two classes. The first class, the nerves of the special senses, keeps the nerve-animal in relation with the external world, to which it is contiguous but not continuous. The second keeps the nerve-animal apprised, as it were, of the organic condition of its own material basis. We have no consciousness of even the existence of the viscera, until they are abnormally modified. Even the cartilages become painful when inflamed, showing the presence of afferent nerves, although they

can not be detected by our microscopes. That they are created during inflammation is utterly improbable, since inflammation is not a state of exalted nutrition, but quite the reverse. It would not be at all fanciful, to suppose that the afferent nerves keep the ganglionic centers informed, as it were, of the organic condition of their respective tissues, just as the optic nerve apprizes the mind of the form, color and position of outward objects. They are intimately connected with the *efferent* nerves, and partly *reflections* of their Force. The vibration of an afferent nerve passing from the stomach to the brain, bears the same relation to the vibration which came down the efferent nerve from the brain, which a reflected green, red, or blue undulation from a natural object bears to the undecomposed solar ray, which was incident upon that object. The nerves of special sense have no efferent nerves in the body to which they are thus correlated. The undulations of the external world, by a bold but significant metaphor, may be called the efferent nerves of the organs of special sense. In other words, they are Forces, which are modified in organic media, and thence propagated to the brain.

The physiological phasis of my subject would be sadly incomplete, were I to omit a brief consideration of the question—what is the Nerve Force—a fluid or a vibration? The older Anatomists and the theoretical Physiologists of the last century looked upon the nerve centers as glandular structures secreting a subtile, invisible fluid, which they called the animal spirit. They supposed the motion of the cranial mass like the systole and diastole of the heart, to circulate this

liquid life, infusing it first into the blood and thence into the tissues. Since the use of improved microscopes has made us more thoroughly acquainted with the structure of the nervous system, this theory has been abandoned. But nothing has been substituted in its stead, and the most extensive works on Human Physiology are provokingly silent upon what appears to me the most important question of both vital and medical science. Muller, who has given us the largest and most thorough treatise, thus dismisses the subject: "Of the nature of the nervous principle we are as ignorant as of the nature of light and electricity, while with its properties we are nearly as well acquainted as with those of light and other imponderable agents. However much these various principles differ from each other, the same questions apply to all; namely, are their effects produced by currents of imponderable matter traveling through space or by undulations of a fluid? The decision as to which theory is correct in the case of the nervous principle, is at present a matter not affecting the study of its laws of action: just as the laws of Optics must remain the same, which ever theory of the nature of light be adopted."

Since this was written, wonderful discoveries have been made of the laws and modes of the so-called imponderables, but no corresponding advance has occurred in the kindred department of nervous Physiology. Great observers spend months and years in making chemical analyses of blood and urine, to procure a few meagre and uncertain data, of comparatively insignificant value, while little curiosity is shown as to the molecular changes going on in the nerve fibers. But

this is exactly characteristic of the existing schools of medicine. In the words of Schleiden, "physical magnitude imposes only on our sensuous nature." The human mind, although well acquainted with the physical properties of natural objects, was for ages ignorant of the commonest laws of Heat and Light, and totally unobservant of the marvels of Electricity and Magnetism. And lo! we now discover that these long neglected principles are the causes of all the phenomena of nature.

Just so the mass of physicians still linger in the outer courts of nature's temple. They are playing as it were, with the outermost of all the concentric wheels of life, whilst the prior and governing motion of the innermost is scarcely detected. In other words they operate coarsely upon the liver, the bowels, the skin, the kidneys, without inquiring whether there may not be a more interior, certain and expeditious method of attaining the same therapeutic end. It is like trying to check the course of a steamboat by tugging at the wheels with ropes and pulleys, instead of condensing the steam in the boiler. The Anatomy and Physiology of the mucous and cutaneous tissues may almost be said to constitute the basis of Allopathic medicine. But it becomes the Homœopathist, who is properly conscious of the vast demands of his science, to labor by a comprehensive survey of the correlations of Physical and Vital Forces, to ascertain not only the laws and peripheral effects of the Nerve Force, but to determine the character of its motion and if possible its mathematical figure. I do not profess to be able to give any definite information upon this abstruse subject,

but would impress upon the minds of future and more capable inquirers, the plausibility of an undulatory theory of the Nerve Force, premising, that its vast importance can scarcely be recognized until it is applied to the phenomena of Pathology and Therapeutics.

Let us revert to the great principal enunciated upon high authority at the beginning of this chapter—that force is *matter in motion*. However incomprehensible it may be to us, that molecular undulations passing into or out of material objects should produce such mysterious effects, it is an ultimate fact from which there is no appeal. Skepticism upon this point merits the remark of Dugald Stewart, that incredulity is sometimes the daughter of imbecility. The undulatory laws of air and water have received a geometrical demonstration. Dr. Lardner's new work on Natural Philosophy is quite explicit in their description. In briefly noticing this work, the Brit. and For. Med. Chir. Review—Oct., 1851—says: "still it appears to be written too much on the old models, and scarcely to take sufficient cognizance of those views, with regard to the fundamental relations of Force and Matter, which are destined we feel sure, to bring about a revolution in the forms (at least) of scientific thought and expression, and to remove many difficulties which must have continually obtruded themselves upon the attention of thoughtful minds. In particular we regret to notice that the fiction of designating Light, Heat, etc., as "imponderable forms of matter" is still kept up. The greatest novelty that we meet with, is a chapter on the Theory of Undulation, which affords an excellent summary of a body of doctrines, that has grown up

within a comparatively recent period into special importance, being not merely related to the subjects of Sound, Light, etc., but even to such questions as the diffusion of earthquakes and the elevation of mountain chains."

The undulating waves of Light have been subjected to mathematical admeasurement. The motions of Electricity and Magnetism are too subtile and delicate for present satisfactory analysis, but from their correlations with Heat, Light, etc., we may safely infer them to be subject to similar laws. Dr. Hare, in describing Galvanic ignition, abandons the idea of any transfer of imponderable matter, and attributes the phenomena to successive waves of molecular polarization, undulating from the centers towards the extremities of the generating batteries. "The immediate cause of the phenomena of Heat," says Sir Humphrey Davy, "is motion, and the laws of its communication are precisely the same as the laws of the communication of motion." Its phenomena have been perfectly illustrated by a comparison with those of sound, which we know to be an undulation. The excitations of Heat and sound are not only similar, but often identical, as in the operations of friction and percussion. They are both communicated, sometimes by contact, and sometimes by radiation. The effect of radiant Heat in raising the temperature of a body on which it falls, resembles the sympathetic agitation of a string, when the sound of another string in unison with it is transmitted through the air. In some cases, indeed, Heat and sound produce precisely the same effects. An artificial magnet loses its property on the application of Heat. The

same effect is produced by ringing it for a considerable time, so as to transmit the vibrations of sound through its substance. An electric jar is discharged either by Heat or friction, the excited undulation in each case being the determining cause.

Dr. Thomas Young, the great philosopher, who established the undulatory theory of Light, suggests also the mutual convertibility of Heat, Light, and Chemical Action. I quote from him the following paragraph, in which the prismatic analysis of the solar ray is the medium of illustration. "If the arguments which have been lately advanced in favor of the undulatory theory of Light be deemed valid, there will be still stronger reasons for admitting this doctrine respecting Heat. It will only be necessary to suppose the vibrations and undulations principally composing it to be larger and stronger than those of Light. At the same time the smaller vibrations of Light, and even the chemical rays, derived from still more minute vibrations, may, when sufficiently condensed, concur in producing the effects of Heat. These effects beginning from the chemical rays, which are invisible, are a little more perceptible in the violet, which still possess but a faint power of illumination. The yellow affords the most Light, the red less Light but much more Heat; while the still larger and less frequent vibrations, which have no effect on the sense of sight, may be supposed to give rise to the least refrangible rays, and to constitute invisible Heat."

The great truth that Force is matter in undulatory motion, can not be rationally dropped at the threshold of Animal Physiology. Human life is a constant

manifestation of Force. The Organic and Animal Forces of the text books are nothing but vague and indefinite vital principles, which may mean anything, and, therefore, mean nothing. They are idealities, and their retention in their present form can only retard the positive progress of Medical Science. If external Heat is an undulation—Animal heat is also an undulation; we have no right to presume it to be anything else. If external Electricity is a successive polarization of molecules—Animal Electricity is the same. The living body is a connected series of organic media, through which correlated and mutually convertible motions are perpetually being propagated. When we consider the Physiology of the Nervous System, and the remarkable correlations of the External Forces with the Nerve Force, an undulatory theory for the Nerve Force, becomes not only a plausible deduction, but almost a mental necessity. The anatomical provisions show conclusively that the facts have not been tortured to fit the theory, but that the theory is beautifully adapted to the existing facts.

This Undulatory Theory of the Physical Forces is transferred provisionlly to the Nerve Force, in a manner recognized as philosophical by Abercrombie, in his Inquiries concerning the Intellectual Powers, page 326: "But there are certain instances, in which a principle ascertained to be true in regard to one set of cases, may be extended by conjecture to others, in regard to which its existence is only hypothetical. This may be called legitimate hypothesis, or anticipation of principles; and it differs in this respect from the fictitious theories already referred to, that it is liable to be either estab-

lished or overturned by the progress of observation. In this manner, the theory of gravitation was hypothetically extended to the motions of the heavenly bodies, long before the observations of Newton had actually established the truth of the doctrine; and the same principle is of legitimate use in medical investigations."

It is not more wonderful that a nerve undulation impinging upon the liver or testicle, should produce bile or semen from the blood, than that undulations of Light falling on the upper surface of a leaf should elaborate or eliminate chlorophyl from the sap. The facts are precisely analogous, and rest upon the same kind of evidence. If the motion of Heat is convertible into the motion of Mechanical Power, there is no reason why the Nerve Force should not pass into the form of muscular action. By this light, we see exactly where to place the Organic Force common to plants and animals. It is the intermediate link between the Physical Forces and the Nerve Force, through which the extremes must necessarily pass. It is a mere aggregate and hypothetical name for certain physical undulatory motions occurring in organic media.

I can not better sum up the cogent reasons which warrant us in applying an undulatory theory to the Nerve Force, than by another extract from the article on the Correlation of Forces, Physical and Vital, in the Brit. and For. Med. Chir. Review, July, 1851: "Under the guidance of the ideas derived from Physical Science, we shall have no difficulty in referring Vital Force to the operation of those external agencies, the influence of which has been long known to be essential to Vital

action, and which have been usually designated by the term *Vital Stimuli*. Thus, the growing vegetable cell cannot decompose carbonic acid, except when acted upon by Light: and the amount of the change which it effects, is in strict ratio (*caeteris paribus*) with the illuminating power of the rays which it receives. So, again, neither plants nor animals can maintain their activity, except under the continual influence of a certain measure of Heat; and the amount of that activity is found to bear a constant ratio, in all those tribes which have no independent power of sustaining it, to the quantity which they receive from external sources: this being true, not merely of the general rate of the vegetative actions of growth and development, but also of those manifestations of vital power which are peculiar to animals. Thus, we may say, that Light and Heat acting upon the organic germ, become transformed into Vital Force, in the same manner as Heat acting upon a certain combination of metals becomes Electricity, or, as Electricity acting upon iron develops itself as Magnetism; and we shall find that this view is in complete harmony with all the phenomena of Vital action. Moreover, the Vital Force thus engendered frequently manifests itself in producing Physical or Chemical phenomena; thus completing that mutual *relationship*, or correlation, which has been shown to exist among the Physical and Chemical forces themselves. Of this we have already seen an instance in the *movements* produced by muscular contraction and by ciliary vibration. The production of Heat, by certain plants and by warm-blooded animals, is another apposite exemplification of the same principle. But the most remarkable illustra-

tion is undoubtedly derived from the Nerve Force; which, whilst itself a peculiar form of the general Vital force, and capable of affecting all the other manifestations of the same force, (as in the modifications which it produces in the processes of Nutrition and Secretion, as well as in exciting Muscular Contraction,) is capable of developing Electricity as well as Light and Heat, and is also capable of being called forth by the action of Light, Heat, Electricity, Chemical Affinity, or even Mechanical Motion, on the nervous tissue. It is a most remarkable confirmation of the views here advanced, that the Nerve Force, which must be accounted in its relations to Mind, as the highest of all the forms of Vital force, should yet be the one which is most directly and intimately related to the Physical Forces—the correlation of Electricity and Magnetism not being more complete than the correlation of Electricity and the Nerve Force may be shown to be."

Just as a certain vibratory condition of the particles of air is called sound, and a certain vibratory condition of the molecules of iron is called Magnetism, so definite undulations among the molecules which compose the axis-cylinder, is called the Nerve Force. The anatomical apparatus is designed to insulate it from the interference of contiguous tissues and to conduct it from one point to another. An anatomical fact which strongly substantiates the theory, is the *isolated* course of every individual filament of the nerves. The highest powers of the microscope have failed to detect any trace of anastomosis or inosculation in the ultimate threads of a nerve-trunk. This serves not only to give every peripheral point a fixed representative point in the

brain, but more especially to preserve the uninterrupted line of undulation from the center to the circumference. We immediately perceive how a division into branches would break the current of undulation, and send a modified form of it down each branch. And this anatomical difference between the blood-vessels and nerves might alone point out their functional difference —one being for the conveyance of a liquid current, the other for the transmission from point to point of an undulatory motion.

The diameter of the axis-cylinder varies, in different nerves, from the $\frac{1}{3000}$ th to the $\frac{1}{14000}$ th of an inch. It is upon this infinitesimal arena that motions occur, which, when propagated to the peripheries, produce, according to the character of the motions, what we call normal or abnormal actions. If an inch be divided into ten million equal parts, the wave of violet Light would occupy only 174 of them, and the extreme red, which is the longest of the luminous waves, only 256 of them. By an easy calculation, we find that a single inch would contain 57,470 waves of violet light; and, again, that from 4 to 20 of them might travel abreast in the axis-cylinder of the nerves. But we are probably making as rough an estimate of the nerve undulations by comparing them with those of Light, as we would make of these latter by comparing them with the monstrous waves of water.

The color of Light depends upon the length of the integral waves in an undulation, and its intensity or brilliancy on the amplitude of the undulatory excursion. The same or analogous laws must necessarily govern the correlated forces. Indeed, *motion* being the funda-

mental basis of all these forces, we can conceive of no difference between them but mathematical or geometrical differences. It is by these differences that nerves of precisely identical anatomical structure execute such very different offices. One form of undulatory motion may be requisite for muscular contraction, another for secretion, a third for sensation. Conversely the same undulation incident upon different organic media in the peripheries, may produce very different results in each.

Such is a theory of the Nerve Force, which appears to be broadly based upon the facts and principles of modern science. The evidence direct and analogical, is to my own mind perfectly satisfactory, so far as any thing can be satisfactory, which may never be subjected to experimental analysis. It is the physiological groundwork of a Philosophy of Homœopathy. If it is unsound and untenable, no man will abandon it and welcome a better more readily than myself. I solicit for it the candid criticism of my medical brethren of all Schools, for the genuine lover of science is a cosmopolite, and I am indifferent whether that criticism confutes or confirms. I have only to urge, that the infinitesimal nature of the motions supposed to occur in the nerves, is no objection at all. The richest treasures and profoundest truths of nature are hidded behind a coarse material veil, beyond the visual power of the microscope. Could our mental constitution be so modified, that a cubic inch of matter would be to us an immense world, and a second of time a thousand years, our discoveries then would be but an approximation to the unexplored wonders which would still lie beyond our reach.

NEURAL PATHOLOGY.

I HAVE thus endeavored to point out what I conceive to be the central fact in Physiology, namely—the existence of definite undulations in the axis-cylinder of the nerves. These are the causes of all vital phenomena just as the solar emanations are the causes of all terrestrial phenomena. The normal continuance of this undulatory motion is health, aberration from its type is disease, and its cessation is death. Any thing which through the blood, the peripheries, or the mind can disturb these undulations may be a cause of disease. The abnormal undulation, however excited, is always the essential or ultimate element of the pathological condition. All the so-called proximate elements of disease, plethora, anæmia, congestion, irritation, pain, heat, atrophy, degeneration, deposit, and all the varieties of anatomical lesion, are but secondary and consecutive phenomena. They are but the external *symptoms* of disease, to the explanation of which the state of the nerve-undulation is the only philosophical key.

On the state and form of external undulations depend all the mechanical aud physical properties of matter. A substance is green, or black, or blue according to the the definite modification its surface produces in the white light. On the same principle with respect to

other forces, a body is cold or hot, hard or soft, a conductor or a non-conductor. Dr. Draper has satisfactorily shown that the yellow ray of light contributes most perceptibly to the organic processes of vegetable life. We can readily suppose that if the intensity of the yellow ray were increased or diminished in any manner, a corresponding excitement or depression would occur in the molecular actions of the plant. But suppose some extraneous cause modified the sun's ray, so that the red or violet was permanently substituted for the yellow undulations, it is evident that great changes would be produced, and probable that even new forms and new secretions would be developed. Similar reasoning might be applied to the calorific, the tithonic or chemical, the electric, and in the animal body, the Nerve undulation. Dr. Draper's theory of ideal coloration is applicable to all the forces of nature. "By the theory of ideal coloration," says that distinguished chemist, "we mean, that as there are modifications of light constituting the seven primitive colors, red, orange, yellow, green, blue, indigo, and violet; so, too, there are similar modifications of the other invisible principles of the spectrum, differing from each other by the length of the waves which constitute them." The precise mathematical differences between various nerve-undulations we may never be able to define or detect, and the peripheral symptoms must ever constitute their distinguishing marks. But we must not forget that upon this infinitesimal scale of motion a deviation from the normal type, which, in the axis-cylinder is so delicate, as to defy the power of numbers or of imagination itself, may become, by descent, into

the subjacent organs, a wide departure from the healthy standard. One modification of this nerve motion may augment, another diminish, a third pervert a secretion, a motion, or a sensation. Augmentation, diminution, and perversion are therefore the natural elementary forms, under which it is usual to study the symptoms of disease.

Disease has been defined "An alteration of structure or function in one or more parts of the body." But as every organic change involves primarily or secondarily a functional derangement, it would probably be better to say, that disease is a disturbance of functional equilibrium, of which there are three degrees. 1st. Functional disturbance not necessarily attended by perceptible organic change—as in hysteria, tetanus, and insanity. 2nd. Functional disturbance attended by uncertain or indefinite organic changes—as in fevers, phlegmasiae, cholera, etc. 3rd. Functional disturbance attended by constant and specific organic changes—as in small-pox, and other exanthemata. To these might be added a fourth—functional disturbance caused by organic change, mechanically or chemically produced. These last only become diseases of the living organism by involving the nervous system. Many of the phenomena going on in a fractured limb are examples of reflex action. And a disorganized patch of mucous membrane, produced by corrosive sublimate, is, in itself, no more a disease than an inorganic nail or hair appended to the body. It is only by modifying the vital condition of the stomach and exciting reflex action, that it is poisonous. With these exceptions, the organic are always the sequæle of the functional changes. The

circulation of noxious matter along with the organizable elements of the blood, is not an organic disease. It can only produce organic changes by acting upon and through the nervous tissue. It is known that the venom of serpents may be sucked from a wound with impunity, if there is no abrasion of the buccal membranes. And if the blood could not get at and affect the nerve substance, the humoral pathology would be a vain dream. Urea, chloroform, or the viri of small-pox and syphilis would go the rounds of the circulation without producing their peculiar and terrible effects, and, indeed, would be mainly deleterious by the exclusion of nutritive material. In the words of Dr. Meigs, "When an organ is diseased, the nerve which makes and dominates that organ is diseased; it is impossible to suppose that the organ can be diseased in any other way."

This neuro-pathology, which refers all morbid states to a primary modification of the Nerve Force, has enlisted in its favor many of the greatest medical names in Europe and America. It interferes neither with Solidism nor Humoralism, but with the all-embracing power of a truthful theory, puts each of these incomplete systems upon its proper basis. Its idea was rudimentally foreshadowed by Sydenham, the morning star of British medicine. "In my opinion," says he, "those disorders which we term hysteric in women, and hypochondriac in men, arise from *irregular motions* of the animal spirits, (the Nerve Force of these essays,) when they are hurried with violence and too copiously to a particular part, occasioning convulsions and pain, and destroying the functions of the respective organs, which

they enter into, and of those also whence they come; both being highly injured by this unequal distribution, which quite perverts the economy of nature." This idea, with various modifications, has been pushed by zealous inquirers into every nook and corner of Pathology.

It has been opposed upon two grounds, both of which are demonstrably insufficient. Firstly, upon the supposition that there is in the animal economy an organic force, capable of acting and also of being modified, independently of the nervous system. This is but a corollary to the false doctrine, that there is an Organic Force, naturally and permanently existing, to which the Heat and Light of the sun, and all the physical circumstances which surround the plant are only the conditions and *stimuli*. But the latest and most philosophical deduction from all the known facts of science, is, that the Organic Force itself is but a modified form of the solar emanations. Indeed, mechanical, chemical, and vital phenomena form an ascending series, of which each includes the preceding. So that the Nerve Force may be said to govern the tissues as a General commands an army; motion, secretion, chemical affinity, animal heat, etc., may be compared to the intermediate officers, each of whom, in his own degree, is a partial embodiment or expression of the will of the common superior.

The second objection is a hasty inference from discoveries made by post-mortem examination. We have the most voluminous records of congestions, hypertrophies, atrophies, indurations, aplastic and cacoplastic deposits, but few traces of the ravages of disease in the

nervous system. What could induce the gentlemen of the scalpel to suppose that the Nerve Force had any thing to do with croup, when they detect a false membrane lining the trachea, and find at the same time that the nerves distributed to it are in the most beautiful and normal condition? When poring over a molecular disintegration of the kidney, exulting at having discovered the veritable foot-print of the monster, disease, they would smile at the suggestion that an abnormal nerve undulation had caused it. The flying hunter secures one cub of the enraged tigress by dropping another in the path of her pursuit to engage her attention; and so it appears as if nature had left these palpable morbid changes at the threshold of the temple to divert the pathological anatomists from penetrating into its interior. The resurrectionists of the profession, they gloat only over the dead relics of Pathology. They fix the locality of disease where they find its debris, like geologists, who might assert that the vast coal beds generally found in the delta of rivers had grown there in a pre-Adamite era, forgetful that the waters had brought them down from the distant inland. I would not underrate the value of Morbid Anatomy, for it is the connecting link, so essential to Homœopathy, between the phenomena of disease and the phenomena of drugs. But I contend that where the scalpel and the microscope fail, the eye of reason, guided by the light of analogy, will be more successful than either.

If the vestiges of disease are unequivocal, and the only landmark to be relied upon, why is it that the organs of greatest physiological dignity, after every indication of existing disturbance, reveal no traces of it

to the dissecting knife? The nerves of a man, who has died with tetanus or hydrophobia, after the most terrific symptoms it is ever our melancholy duty to witness, frequently display no more evidence of such extraordinary agitation than the delicate tissues of a new-born infant. Dr. James Johnson, whose literary and scientific capacities were so happily conjoined, thus remarks upon this subject. "The nervous and vascular systems are mutually dependent on each other, and to which was given the *first* impulse by the hand of our Creator, it is needless to conjecture. In respect to diseases, however, there is every reason to believe that their *causes* operate *primarily* on the nervous or sentient system of our frame, and secondarily on the vascular system. This, indeed, we can not prove by dissection. The brain and nerves of a furious maniac will frequently, nay, generally, exhibit precisely the same appearance as those of a contemplative philosopher. That this is the case with respect to the brain, (whose texture is so susceptible of impressions,) in that greatest of all functional diseases, insanity itself, is now proved beyond a doubt. I may refer to the dissections of Esquirol, a man who has had more opportunities of investigating this subject, than any man now living, for the truth of this position. As for the nerves, no pathologist will be so hardy as to say he can recognize the marks of disordered function in them. Neither is it meant to be denied, that some *change* of structure or organic arrangement takes place in lesions of *function*. All I maintain is, that such change, (if there be change,) is not demonstrable at the present state of our knowledge."

Now, this change is the abnormal nerve undulation, which of course ceases with the death of the centers from which it was propagated. To seek for its vestige in the axis-cylinder after the arrest of its functions, would be as senseless as to attempt to trace the flight of a bird in the air or the course of a ship in the sea. And to detect the motions of the Nerve Force in the living tissue, so as to sketch its geometrical proportions in diagram, might require an optical power which would magnify a pebble to the size of the Sun, and a silken thread to the dimensions of the Milky way. The inefficiency of pathological changes to explain the phenomena of disease, led the acute mind of Hahnemann to a hasty misconception of their value. And the metaphysical bias of his intellect was so strong, that he went to the other extreme, and propounded a spiritual, dynamic and immaterial theory of disease. His hypotheses can not constitute the spirit to animate the vast and magnificent body of facts he has presented to the world.

His immaterial etiology of diseases threw him upon the study of symptoms as the only practical reliance in their treatment. And after all the learned diquisitions upon the *causes* of disease, I can not perceive that any one has advanced a step beyond him. The symptom is the external expression of disease just as a word is the sign or embodiment of an idea. Symptoms include the whole of Allopathic Semeiology and Pathological Anatomy, besides our own brilliant science of Pathogenesis. I propose to make a higher step, and put the essential nature of disease on the loftiest *physical* ground which can possibly be taken. The symptoms

of disease form always a descending, not an ascending series. I know it is frequently directly the contrary in appearance—for the fact seems almost axiomatic, that the nervous system is sometimes secondarily implicated. But the study of natural physics will infuse into the medical student a wholesome skepticism as to all *appearances*. The sun seems to rise and move round the earth, but we know, philosophically, that neither is a reality. Parallax or apparent motion in an object from real motion in the observer, is by no means confined to the heavenly bodies. In the electric spark, it seems as if a flash of fire passed from one body to another. But this would be a puerile explanation of the successive electrization of the particles of atmospheric air, commencing simultaneously at each polar terminus, and meeting in the middle of the intervening space. An evening fog appears distinctly to rise up from the meadows gradually towards the hills, whereas precisely the reverse occurs, for the invisible vapor sinks down to the earth by gradual condensation at its surface.

Statement of appearance can be no essential argument against the theory that an abnormal undulation is the primary element of disease and the *cause* of all the symptoms. We may not detect it microscopically, but its existence beng conceded, we can show by a beautiful physical law, how it can be modified, and how disease in the peripherics can be cured. The opponent, who shall undertake to render the theory improbable, has to bring stronger evidence than has ever yet been brought, to prove that the Nerve Force is not the ruling force in the animal body. He has to prove that there is no

correlation between Physical and Vital Forces. He has to prove that *Force* is not matter in motion, but something else. He has to prove that undulations can not be geometrically modified, and that such modification could not produce changes in the ultimate action of the undulation. And, finally, he must explain better and more philosophically, the many curious points in Pathology and Therapeutics, to which this theory gives a ready and consistent solution.

The healthy functions being all maintained by the constant impinging of certain nerve undulations on the different tissues, the first action of a morbid cause must be to increase, diminish, or, as it were, geometrically modify these undulations. The action may begin at the periphery and be propagated toward the centers, or through the medium of the circulation, strike the first blow on the centers themselves. But besides this class of causes, which is sometimes obvious even to our senses, there are causes so occult that we can not imagine how or where they begin to affect us. Passing over entirely the obscure and curious subject of the mental origin of disease, let us look at the necessary connection between internal and external forces. The human body, as a material structure, bears definite relations to the material structures around it. It is pervaded also by forces which must bear definite relations to the forces without. An internal power is constantly at work to keep the atmospheric pressure from crushing the tissues together. When this is artificially increased or diminished, various modifications of the entire economy may ensue. But the Heat, Electricity, and Magnetism of the animal body in health, maintain also

a certain equilibrium with the Heat, Electricity, and Magnetism of terrestrial origin. Disturbance of the natural balance, imperceptible even to our senses, may modify the Nerve Force so as to produce disease. Electrical charges in the atmosphere sometimes make an obvious impression upon us. This may be an infinitesimal representation of the process which takes place in death by lightning.

Reichenbach has given us some curious cases of sensibility to Terrestrial Magnetism in highly sensitive subjects. They slept uneasily except in a position parallel with the magnetic meridian, and the symptoms of disease were speedily alleviated when they assumed that position. These facts, however, are not generally accredited by the profession, not so much on account of their intrinsic improbability, as from the want of accumulated evidence necessary to the adjustment of such delicate and mysterious questions. The possible morbid influence of terrestrial magnetism, however, is recognized by a large portion of medical men, who have sought in its disturbances for the causes of cholera and other diseases. As an example, I take the following extract from the 148th Lecture in Bell and Stokes' Practice, on the alledged causes of intermittent fever: "Dr. Heyne, of Madras, in a paper on the hill fevers of India, ascribes them principally to the geological character of the hills among which they occur. This consists in a predominance of iron granite, or magnetic iron stone rocks. Other districts, of a different geological character, are invariably free from the fever. Certainly no *a priori* reasoning, in which faith in marsh miasm should enter, should lead to a conclusion of this

nature. The immediate cause of the fevers in question is attributed by Dr. Heyne, to the magnetic or electric fluid, which seems to exist in the greatest abundance in the iron hornblende, and is disengaged in great quantity in the hot season. The first rain that cools the atmosphere to 74° puts a stop to the discharge of the magnetic or electric principle, and to the further progress of the fever. Here are moisture and a certain temperature, constituting the two chief conditions for the evolution of miasm, and yet precisely where these two are united the hill fevers cease." Now, we know that when one body electrizes another by induction, undulations are excited in this latter, which were not in action just before. And there is no difficulty in conceiving that those agencies, which are essentially undulating movements of matter, may modify the nerve undulations. Indeed, with those who discard this hypothesis, lies the onus of furnishing one more satisfactory, and more accordant with natural laws.

A vast portion of the human body, the skin, the lungs, and the alimentary canal, is a vital surface presented to the outer world, between which and itself continual exchanges and reactions are taking place. Between this surface and the nerve centers there is a perpetual circle of nerve undulations, by means of the afferent and efferent filaments. Any modification of the surface, or any part of it, mechanically, chemically, or otherwise occasioned, will cause a new undulation to be transmitted to the centers, from which reflex actions in great variety may be excited. Such is the commissural connection of centers, that these reflex actions may fall upon very distant organs. The case of a frac-

tured limb will illustrate this class of causes. Here the bone, blood-vessels, and nerves of the part are violently ruptured. The pain so excruciatingly aggravated by motion, is just such as we may produce by pinching or pressing, or even touching the cut end of an afferent nerve nearest the centers. This abnormal undulation, sent to the centers, excites the reflex undulations, which produce all the phenomena of inflammation, and sometimes even nausea, headache and general fever. The undulations, generated by the reaction between the blood and the vesicular neurine, still flow down the efferent nerve, and repair the injury by virtue of the same power which formerly effected the nutrition of the part. It is well known that coagulable lymph effused in the living body is metamorphosed more or less completely into the kind of tissue with which it is in contact. This has been compared to the condensation of crystalline particles from a solution, around a nucleus of the same crystal introduced into the solution. Here a catalytic action is inferred to take place between the liquid and the solid. This may or may not occur between the lymph and the fractured surface, for the creative power of the nerve undulation is sufficient to account for the phenomena. If Dr. Meigs' idea that a bile nerve produces bile, be true of all nutrition, as our theory assumes it to be, then nothing can be more evident than that the definite undulation of a particular efferent nerve, passing into an organizable material, will construct bone, ligament, cellular tissue, or some other form of animal matter, the form to be determined by the nature of the undulation, and not by any affinities or forces independent of it.

The action of cold upon the surface of the body is one of the most common causes of disease, and its *modus operandi* is a subject of deep physiological interest. In studying it, we must bear in mind that there is no positive impression made upon the body. This is merely a provisional way of expressing the idea, that in certain external conditions the system is modified by the abstraction of its caloric. The primary steps probably are, arrest of secretion and a molecular modification of the surface, indicated by the corrugated skin and the shrunken vessels. Look now at the necessary condition of the efferent and afferent nerves. The undulation from the former is not broken up in the accustomed manner, but reflected as it were and partially or wholly arrested. The vesicular centers of all this surface impressed, cease to eliminate from the blood their normal quota or degree of force. According to our doctrine of essential unity and mutual convertibility, this surplus or retained force is distributed to other parts. The internal viscera are not only congested in a well recognized mechanical manner, but supplied with Nerve Force to overcome this congestion, and equalize the different functions. The afferent undulations from the modified surface may also contribute to the reaction. Seebeck discovered that electrical currents are excited by modifying the two ends of the same metal, either by heating or freezing one of them. Nobili further observed that in this deranged equalization the current was always established from the hotter to the colder part. And so I suppose a current of stronger and more powerful undulations than usual is sent from the vesicular center to the periphery, and being broken up

into heat, chemical action, etc. overcomes the morbid stasis of function. We thus see how the use of the cold bath is the most valuable excitant to all the processes of life. And here too lies the secret of Hydropathic success, a success which would have been long since thoroughly recognized by the profession, had not certain exclusivists opened Hydropathic institutions for the treatment of all diseases. This is but an example of the common fact, that the abuse of a thing by one part of mankind deters the other part entirely from its use.

But suppose this disequilibrated external condition persists and reaction does not take place? The congested condition and the unnatural activity of the internal viscera also persist. We then say in a general manner that the weakest point or the most susceptible part suffers, so that one person may contract a pneumonia, another a diarrhea, and a third some form of fever. If the cause still continues, death may be produced before any local derangement has time to manifest itself. Anæsthesia of the surface becomes very marked, because the undulations in the afferent nerves become feebler and finally cease. The sleep of death comes more or less gradually on, produced probably by two proximate causes—firstly, the lack of the stimulus of sensation, and secondly the cerebral congestion, which by modifying the vesicular centers, deprives them of this property of generating the Nerve Force.

Another of these peripheral causes is the presence of indigestible food in the alimentary canal. That portion of the ingesta which is not assimilable must clearly act as a foreign substance. A certain quantity of such

matter seems to be not only consistent with but necessary to the proper functional activity of the chylo-poietic viscera. This is discharged as residual or fæcal substance. But when there is any surplus it is as certainly irritative as the presence of a bullet in the flesh, or a grain of corn in the trachea—although its effects are not similar because of the different forms and functions of the tissues with which it is in contact. There is an abnormal outlay of force in the upper portion of the tube, at first to break down and digest, and then to expel and get rid of the offending material. To furnish this force there must be an infringement, according to our theory, upon the supply of other parts, and hence the headache, the dyspnœa, the palpitation, the dry skin, the malaise, debility, and constipation, which may be singly or collectively exhibited. And hence also the increased intestinal action, producing colicky pains, and finally, expulsive diarrhea.

The simplest explanation of all these phenomena is by the modifications and transference of the undulating Nerve Force. But an attack of cholera-morbus is only an exaggerated picture of what occurs every day in the body of a glutton. This species of intemperance gradually modifies the organic condition of the whole intestinal periphery, so that the nerve undulations can not be resolved or broken up into the natural subordinate forces, during their passage through the changed medium. This interferes with the initiary steps of hæmatosis, or blood-making, and to this impoverished blood, from which the Nerve Force can not be sufficiently eliminated, we must look for all the complicated and vexatious phenomena of chronic dyspepsia. A similar

train of reasoning will account for the modification of the general health of a woman, produced both by the physiological and pathological conditions of the uterus.

The humoral pathology is one of most extensive application. An abnormal state or crasis of the blood, is a valuable connecting link in our theory between some of the causes of disease and the production of the modified undulations, which we suppose to be the first material expression of the morbid cause. If the Nerve Force be eliminated by the reactions between the blood and the vesicular neurine, then the constitution of the blood is a most important determining element of the nature and form of that force. Changes in the blood must necessarily increase, diminish, or geometrically modify the undulations. In a brilliant article on the Physiology and Diseases of the Nervous System, in the Brit. and For. Med. Chir. Review, January, 1850, the humoral origin of Chorea, Tetanus, Epilepsy, Hydrophobia, and Hysteria, is ably advocated. These diseases in which nervous phenomena are so prominent, arise from the action of modified blood on the nerve centers. To all this our theory assents, and only superadds that its mode of acting is by the production of abnormal nerve undulations which cause and account for all the peripheral or tangible phenomena of disease. The nature of the undulations varies of course with the disease, the different degrees or shades of the same disease, the particular centers most affected, and the constitution and habit of the individual. Hence although the cause of the disease may be positive and unitary, the symptoms may differ in different individuals, just as human faces differ, although constructed on a funda mental type.

The blood may be modified by the insufficient hœmatosis which must result from the derangement of the lungs, or of the chylo-poietic viscera. The blood-making apparatus may be perfect, but if the proper material is not presented to it, the blood must be impoverished, as in the case of scurvy at sea, and in many of the diseases of the poorest class in great cities. The blood may be modified by the introduction of various material into it—by venous and lymphatic absorption of material particles impinging upon the pulmonary and alimentary tissues, or any abraded surface. This is the *modus operandi* of those poisons, medicines, and specific viri, which pass into the circulation, and do not enter into chemical combination with the peripheral structures. And lastly, the blood may be modified by the retention within its mass, of elements which the proper tissues have failed to excite—for instance bile and urea. Such is a brief survey of the most prominent causes of disease. There is nothing in the nature of these causes to preclude, and indeed every thing to favor the idea, that an abnormal nerve undulation may be the primary element of disease. There is no evidence that any agent, which does not act mechanically or chemically, can have any direct influence upon the organism, except through the medium of the nervous system. An injured or diseased organ may, by the sympathetic excitation of abnormal undulations, produce the phenomena both of drugs and of other diseases. It is thus that a deranged stomach may cause a cutaneous eruption which disappears with its own regulation. It is thus that a painful boil, a wound, or an inflamed tissue, may act as an emetic, a cathartic, or a diaphoretic to the rest of the system. From the

synthesis of these various considerations we get the general fact, that the nerve centers are the points to which all the radii of causes converge, and from which all the radii of disease diverge.

This great truth meets with but little opposition when we apply it only to those diseases which are considered purely nervous. But in studying disordered conditions of the circulation and particularly of secretion, we are apt to look for disturbing causes more apparent to our senses, and accordant with our preconceived opinions of the independence of the chemical action of organic life of the nervous system. The neuro-pathological theory of inflammation is especially dominant in Germany, and is upheld by the great names of Treviranus, Baumgartner, Henle, and Rokitansky—the last, the greatest Pathological Anatomist in the world. Mr. Paget, in his invaluable Lectures, although proposing a neutral theory, confesses that a disturbance of the Nerve Force is always the initiator to the phenomena of inflammation. He says moreover that the disturbances of the circulation are no more adequate to explain the phenomena, than the merely mechanical movements of the blood are adequate to explain the process of nutrition.

Dr. Marshall Hall shows how the nervous system acting through the intermedia of the muscular and vasculas tissues, as secondary and testiary causes, may produce certain acute and chronic diseases. "The phenomena of blushing," says he, "is familiar to every one. Obviously, the effect of emotion, I have suggested the contraction of the platysma-myoides on the external jugular, as the second link in the chain of cause and effect, and the impeded return of blood

along the latter as the third. Let us imagine a similar condition of the internal jugular; there will be a state of blushing, in other words, of congestion of the cerebrum, with oblivion, stupor, and even apoplexy. Or let the vertebral vein be so affected, and a similar condition of blushing of the medulla oblongata will accrue, with varied spasmodic affections, such as strabismus, laryngismus, or even epilepsy. I have actually seen a state of recurrent venous blushing in the hand of an infant affected with convulsions. If these veins be so affected, not singly, but conjointly, it is obvious that a more complicated result will take place." This is very plausible, but we have every reason to believe in the direct power of the Nerve Force over the capillaries of the internal viscera without any intermediate agency whatsoever. It has been proved by many experiments that the capillaries of a living animal in health resist even a powerful mechanical force to inject them, and that the state of the Nerve Force is the accurate measure of this resistance. This would lead to the inference that the diminution of the nerve power, in a certain point, would cause that hæmostasis which is one of the first elements of inflammation.

The discoveries of M. Bourgery, of which I take a summary from Ranking's Abstract for 1849, Part 1st, bring the capillary circulation into more direct and beautiful relation with the nervous system than has been heretofore pointed out. In addition to the capillary or intermediate system of vessels at present admitted by anatomists, and which M. Bourgery considers as constituting a mere anastomosis between the arterial and venous radicles, he describes a circulation of capil-

liculi, forming a diverticulum of the general circulation, and pervading more minutely than the capillaries, the ultimate element of every organ. These he looks upon as the proper and special organic circulation by which, in different organs, the functional changes of nutrition, secretion, etc., are carried on. The general circulation in itself does not produce any functional changes, but merely preserves unbroken and independent of the activity of the special circulation, the progressive movement of the blood, which at all times passes over in part from the arteries to the veins through the capillaries; while the capilliculi receive a part of it for elaboration in the special tissues to which they are destined. These capilliculi are impervious to all particles which are not in a state of extreme subdivision, even the blood corpuscules being too large to pass through them. Nevertheless, M. Bourgery says that they may be always traced, varying in disposition according to the organ or tissue in which they are situated. These partial or local circulations are special and heterogeneous in their distribution. Moreover, they are only periodically active, showing their intimate dependence upon the nervous system. Here is probably to be found the *punctum saliens* of all the anatomical lesions of disease. And thus every provision seems to have been made for that relation of the Nerve Force to all the vital phenomena, which it is an essential point in our theory of Homœopathy to maintain.

To illustrate the fact that the Nerve Force is the modifying cause in the diseases of the secretory organs, I will adduce examples of the great types of modification—increase, diminution, and perversion. And in order to

limit the primary causative element to the nervous system alone, the cases shall be those of deranged secretion, traceable to no cause but mental excitation. The lachrymal secretion, which is always being generated to a small extent for the purpose of lubricating the eyeballs, is found out in great quantity during the psychical states of joy and grief. Here is a greatly increased nutrition of a gland under circumstances where no explanation by vascular turgescence, increased chemical affinities, external sources of irritation, etc., is at all admissible. These and the concomitant phenomena are evidently the consequences of modified nerve undulations transmitted from the brain, principally by the cranial portion of the great sympathetic. Dr. Chapman tells us, on what authority I know not, but his own name is sufficient authority the world over, that Murat, King of Naples, was immediately jaundiced by a fit of rage, into which he fell upon hearing in Russia the false report, that his Queen, the sister of Bonaparte, had usurped his throne. The hair has been speedily whitened by fear, and here is an unequivocal instance of a man turned instantly as yellow as gold by passion. The suspension of the salivary secretion by fright is curiously used by the people of India in judicial investigation. To discover a thief among the servants of a family, all the suspected persons are compelled to hold a small quantity of rice in the mouth for a little while. It is generally found that the one whose mouthful is the least moistened with saliva is the offender.

An extraordinary case of perverted secretion, I quote from Carpenter's Physiology. "The following is perhaps the most remarkable instance on record of the

effect of strong mental excitement on the mammary secretion: the event could hardly be regarded as more than a simple coincidence, if it were not borne out by the less striking but equally decisive facts already mentioned. A carpenter fell into a quarrel with a soldier billeted in his house, and was set upon by the latter with his drawn sword. The wife of the carpenter at first trembled from fear and terror, and then suddenly threw herself furiously between the combatants, wrested the sword from the soldier's hand, broke it in pieces, and threw it away. During the tumult some neighbors came in and separated the men. While in this state of strong excitement the mother took up her child from the cradle where it lay playing, and, in the most perfect health, never having had a moments illness; she gave it the breast, and in so doing sealed its fate. In a few minutes the infant left off sucking, became restless, panted, and fell dead upon its mother's bosom. The physician who was instantly called in found the child lying in the cradle, as if asleep, and with its features undisturbed: but all his resources were fruitless. It was irrecoverably gone. In this interesting case the milk must have undergone a change, which gave it a powerful sedative action upon the susceptible nervous system of the infant." Here is a chemical alteration of milk, the epitome of human food, into a substance almost as poisonous as prussic acid, of which a mental agitation was certainly the primary cause. Through what medium did it operate? When we recollect the strict physiological connection of the mind with the nervous system, our theory of abnormal nerve undulations becomes the most plausible explanation of the

phenomena which can be presented. And if we can fix this second link in the chain, so that we can fully believe that a definite geometrical modification of a molecular motion propagated along the axis-cylinder of nerves is the cause of the peripheral changes, we can readily conceive how diseases and drugs which similarly modify the vesicular centers, must necessarily produce similar results.

The symmetrical feature in some diseases, illustrated by Mr. Paget and Dr. Budd, is a further confirmation of this theory. A morbid material may fasten upon certain spots or islands upon one side of the body, leaving the surrounding parts unaffected, and precisely similar spots or islands appear in like manner on the opposite side. Mr. Paget refers these curious phenomena to a perfect chemical identity between the corresponding tissues of the two sides, so that they have the same reactions with the blood. But this is only pushing the question still unsolved further off. What is the cause of the perfect chemical identity? Why is it that however closely one portion of skin or bone may seem to resemble another portion of skin or bone, the only parts that are exactly alike are those which repeat each other on the opposite side of the body? It appears to me most probable, that the chemical as well as the morbid identity of the two parts are due to the controlling and creative power of the nervous system, whose anatomical elements are so beautifully and perfectly symmetrical. This symmetry of disease is not limited to the highly vitalized tissues nor to the human species. Mr. Paget refers to the pelves of two lions, in which new osseous matter had been deposited as the pro-

duct of some disease resembling human rheumatism, in a most complex and irregular pattern. In these bones almost every spot and line in one was represented in the other, with an exactness only inferior to the symmetrical correspondence naturally existing between the two lateral halves of the osseous system. But Dr. Chapman cites a case of jaundice showing another kind of symmetry, still more clearly referable to nerve-modification. The man was of a deep yellow color on one side of his body. The demarcation corresponded so closely with the median line that one half of the nose was deeply jaundiced while the other side was as white as usual. Here the chemically identical tissues of the two sides did *not* excite the same reactions with the blood. Where can we look for the modifying cause but to the nervous system? The fact that paralysis of sensibility or motion may be precisely confined to one half of the body, should point us to the true cause of this analogical phenomenon in the parenchyma of organic textures.

The objector may ask, of what value can these hypothetical undulations be, if their derivation from the normal type can neither be seen nor measured? How can we even know of their existence? The symptoms, we say, are the representatives—the *fac similes* of the undulations—the mere translation of the same sentence into a different language. Herschel quotes an anecdote quite in point from Capt. Head's amusing and vivid description of his journey across the pampas of South America. "His guide one day suddenly stopped him, and pointing high into the air, cried out 'a lion!' Surprised at such an exclamation, accompanied with such

an act, he turned up his eyes, and with difficulty perceived at an immeasurable hight, a flight of condors soaring in circles over a particular spot. Beneath that spot, far out of sight of himself or guide lay the carcass of a horse, and over that horse stood (as the guide well knew) the lion, whom the condors were eyeing with envy from their airy hight. The signal of the birds was to him what the sight of the lion alone could have been to the traveler—a full assurance of its existence."

Now the symptoms of disease are to the Homœopathic practitioner the signals of definite modifications in the nerve undulations. The abnormal undulation is like an unknown quantity in an algebraic formula, and for all practical therapeutical purposes, there is no necessity for it to be eliminated. The object of our research is to get a medicine which shall produce a similar undulation. This we estimate by its effect. If $A = B$, and $C = B$, we know that $A = C$. Hence our great efforts to establish as many points of correspondence as possible between the disease and the drug. Their undulatory elements must be similar, although not identical. To Allopathic practice, this theory and the facts which support it, are of no value, and have no significance. But when we recollect the fixed physical law that two similar undulations may so pass through the same medium as mutually to destroy each other, we see their vast importance to the exposition of our great principle "*similia similibus curantur.*"

I can not leave this deeply interesting subject without making a quotation from Dr. Stokes, whose opinions are uniformly received with profound respect by the lovers of medical science. "When we reflect on

nervous phenomena, and consider how occult, how mysterious the properties of those organs which give rise to them are, we are struck with the discrepancy between cause and effect. No medical man has ever witnessed a case of confirmed tetanus or hydrophobia without being oppressed with the conviction of the imperfect and limited state of our knowledge of nervous disease. It may be very possible, that in these neuroses the change, though so slight as to escape our means of detection, does absolutely occur; and yet such is the nature of nervous phenomena, that we must admit that great and extraordinary effects are produced by very slight causes. Do we see anything like this in nature?—any remarkable alterations in properties depending upon apparently slight causes? We do—we see extraordinary changes taking place in the character of various inorganic substances (to which I need not particularly allude,) and there is no reason why the same thing should not occur in organic structures. On considering the doctrine of Isomerism, I should be inclined to think that it throws some light on this obscure subject. In chemistry, it is a well known though singular law, that the properties of two bodies may be essentially different at the same time that their respective component elements are, as far as our knowledge goes, identically the same; and the change, whatever it may be, appears to result, not from the attraction or removal of any of the component atoms, but from their peculiar juxtaposition.

Now, it being admitted in chemistry, that many bodies having the same constitution possess totally different properties, and this difference being explained

by the different position of their elements, it does not seem strange that the same thing should take place in the phenomena of organized beings; and, if this be the case, we have a key towards elucidating the nature of these neuroses, and can conceive how an analagous change—a difference in the arrangement of the molecules of the component parts of the nerves or of their centres—may produce new modifications of their properties without making any distinct change in their nature, or adding or subtracting a single organic molecule. I am much inclined to adopt the opinion of those who think, that in the neuroses, a peculiar organic change actually takes place, though we can not demonstrate its existence, because, to reason on the phenomena of animal life independently of organization, is to plunge blindly into hypothesis, and retrace the errors of an antiquated and exploded school."

Dr. Stokes here recognizes every fundamental principle for which I have been contending, viz., that extraordinary effects are produced by apparently slight and imperceptible causes—that the interpretation of disease must have a physical or organic basis—that the laws of the inorganic or external world are transferable within certain limits to vital phenomena; and finally and principally, that the molecular disarrangement of nerve structure is the cause of the different phenomena or symptoms of certain diseases. Here, indeed, is the unequivocal germ of my whole theory, and if the principles were not the general teachings of modern science rather than the special dicta of Dr. Stokes, I would give that gentleman the credit of having suggested to me my exposition of Homœopathy. Dr. Stokes, how-

ever, leaves the nervous texture locked in a state of crystalline repose. But when we recollect that its vitality is exactly measured by its motivity; that its motions influence, and, indeed, produce the peripheral phenomena; and when we study, moreover, its correlations with other known and analyzable forces, the Undulatory Theory of Function and Disease becomes both plausible and probable. Dr. Stokes, in the spirit of professional exclusivism, would probably dissent from all my inferences. But it is a great natural law, that one investigator of truth, having fulfilled his task, becomes the stepping-stone of another, destined in his turn to be the mere foot-stool for a still higher ascent.

ACTION OF HOMŒOPATHIC MEDICINES.

The doctrine of the efficacy of the Homœopathic attenuations, is considered the weak point of the system. The very source of its practical superiority is made the ground of its theoretical rejection. It is against this that every opponent levels his artillery of argument or ridicule. And here the most successful appeal against Homœopathy is made to ignorance and prejudice both in and out of the profession. The question at issue is one of the most curious and wonderful ever presented to the human mind. The whole fallible experience of mankind is arrayed against the claim. Theory after theory urged in its support have been pronounced untenable, but the appeal to facts is becoming louder and more eloquent than ever. The extraordinary persistence and progress of an idea, so adverse to our preconceived opinions, and unsanctioned by high authority, might alone suggest to the contemplative mind, the inherent power and vitality of unappreciated truth. The theoretical arguments both for and against, have appeared to me equally unconvincing and unsatisfactory. I will pass some of them briefly in review, before offering my own conception of a series of facts enforced upon my belief by observation and experiment.

Uniformity of sequence is the basis of our idea of causation with regard to any phenomena, that is to say, when we have observed one event uniformly follow another event, we consider the first as cause and the second as effect. If, for instance, a hundred or a thousand cases of fever were treated with tarter emetic, and if soon after the administration of the medicine, diaphoresis occurred and the fever uniformly subsided, we are justified in assuming that this *post hoc* was really a *propter hoc*. At least, upon this reasoning the entire practice of medicine is founded. Now, the Homœopathist contends that he will show as many cases of fever, hundred for hundred, and thousand for thousand, treated with the 3rd dilution of Aconite with as prompt and uniform success. Why is the relation of cause and effect denied in this case and admitted in the former? The Allopathist says, my tartar emetic nauseates and reduces vascular action, and thus exhibits its dynamic character; your aconite produces no sensible action, and as it gives no evidence of power, I can not ascribe to it any effect. To our suggestion that its virtue was expended in removing the disease, he replies, that unassisted nature can do that. But if he says that our thousand cases got well without medicine, why may we not just as logically say that his thousand got well in spite of his medicine?

The obvious nausea and other symptoms of drug action have deceived him. How did tartar emetic produce these effects? He will confess, through some occult impression upon the nervous system. So that in their primary action his tartar emetic and our aconite stand upon the same footing, affecting the

centers of life in a manner unknown and imperceptible, to us. His drug produces a peripheral disturbance, which, according to him, is the second link in the cure. We believe our drug cures directly, without any intermediate perturbation. We give just as sound theoretical and just as much practical evidence as he does. His obstinate incredulity is based entirely on a theoretical objection. He assumes that our knowledge of Physiology and Therapeutics is so positive and perfect, that we can affirm, without hesitation, that a medicine, inappreciable in its action, can not display any curative power. This assertion may be hastily made, but will be reversed, on sober second thought, by every physician of respectable attainments or modesty.

Indeed imperceptibility of action is frequently attendant upon the most powerful agencies. How does vaccination enable the system so long to resist the virus of the small-pox? Every one is familiar with the remedial efficacy of mineral springs, of which the saline ingredients may display no more positive effect than Homœopathic medicines. How do the *alterative* medicines of the Old School act? It is well known that minute doses of calomel, iodine, arsenic, quinine, iron, nitrate of silver, and other substances, produce entire revolutions in the system, with no perceptible effect, other than the disappearance of the morbid condition. Where is the *vis medicatrix naturæ* to take the credit of all this cure of scrofula, neuralgia, syphilis, and intermittent fever? Diseases which display a tendency rather to an indefinite destruction of organic textures, than to spontaneous recovery, are thus imperceptibly alleviated or cured. The class of remedies

which effect this, is the most valuable in the old Materia Medica, and they generally act upon obvious Homœopathic principles. Nevertheless they are used in perceptible doses, say the Allopathists, from the $\frac{1}{10}$th to the $\frac{1}{2}$ of a grain. But what is the difference between a perceptible and an imperceptible dose, if both act without occasioning any disturbance whatever, and both gradually remove the symptoms of disease? The onus is thrown on our opponents, of drawing the line of demarcation—of defining at what exact point of the scale of tenuity, a drug ceases to be curative and becomes "transcendental moonshine." Theory can not advance us a step toward the settlement of this question, and from experiment, philosophically conducted, we have every thing to hope and nothing whatever to fear.

One of the most common and unfair methods of argument against the efficacy of attenuations, is by comparing them with the crude drugs. Ten grains of jalap will purge, one grain will not purge. How then, it is reasonably asked, will the $\frac{1}{10\,000}$th of a grain purge? Two grains of opium will cause sleep, one grain less sleep, half a grain still less. How then can the millionth of a grain have any effect at all, since the effect disappears proportionably as we diminish the quantity of the medicine? If Homœopathists professed to purge with jalap and to narcotize with opium, this argument would be unanswerable. But that would be using Homœopathic preparations on Allopathic principles, than which I can conceive nothing more ridiculous. Our jalap is not a cathartic, but an anti-cathartic; our opium is not a soporific, but the reverse.

Why will not Allopathists remember, that when the line of direction of a drug is changed, all the circumstances of the case are so altered, that reasoning by analogy becomes palpably illogical? Their comparison of the drugs in question, reminds me of the silly formulæ made by little school boys, just commencing the Rule of Three—such as, if a pound of soap cost a dime, what will a bushel of corn come to? in which there is no natural relation between the elements of the problem. When we begin to apply a remedy Homœopathically, we enter on a new field of observation, in which all previous experience with drugs is comparatively valueless. It becomes our obvious duty to record the facts and to practice upon them, leaving their theoretical adjustment entirely out of sight. The accumulation of facts should always precede the more agreeable task of deduction and generalization.

Some of our opponents delight in estimating how much alcohol or sugar of milk is required to prepare our attenuations. These mathematicians bring out the most astounding results, which are calculated to make very false impressions upon the unthinking. Thus, one gentleman states, that to make the 20th trit., a sphere of sugar is demanded with a diameter of fifty millions of miles. Another says, it would take ten thousand Adriatic seas of alcohol to make our 17th dilution. These monstrous proportions appear still more so when compared with the absolute quantity of alcohol and sugar of milk existing in the world. Now it has been carefully estimated, that to prepare the degrees of attenuations in question, half a pound of sugar of milk, and three ounces of alcohol, are amply sufficient. But this

imposing array of figures is rather designed to exhibit the minute quantity of the medicine employed—a point at which Homœopathists are not disposed to cavil.

Dr. Forbes, indeed, complains of mental fatigue in attempting to grasp an idea of our infinitesimal fractions. Just the same kind of fatigue is felt in surveying the wonderful calculations of astronomy. The discoveries of the telescope are as marvellous as those of the microscope, and the infinite is as incomprehensible as the infinitesimal. The violet wave of Light is seventeen millionths of an inch in length, and vibrates seven hundred and twenty-seven millions of millions of times in a second. Here is mental confusion for you, but who for that reason doubts the miraculous and organizing power of Light? The inference, that matter so attenuated is necessarily inert, is hastily and illogically drawn. That such matter can not nauseate, sweat, purge, narcotize, etc., I confess. But that it may produce an abnormal nerve-undulation, similar to that of the disease, is highly probable, and certainly not at all disproved.

To combat this idea, the time and talents of the Allopathist must be differently occupied. He must show that we annihilate the matter, and that there is nothing at all in the supposed medicine but the vehicle, alcohol or sugar of milk. He must prove that we arrive at an ultimate indivisible atom, before the degree of attenuation we profess to have obtained. If he should not be conversant with the present state of the atomic theory, Prof. Whewell will give him the standard expression of the greatest philosophers on that subject—Aphorism, the 79th, Philosophy of the Inductive Sciences. "The

Doctrine of Atoms is admissible as a mode of calculating and expressing the laws of nature, but is not proved by any fact, chemical or physical, as a philosophical truth." He must further show, that there is no need of such a rational correspondence as that we contend for, between the tenuity of the substance acting and that of the substance acted upon. And finally, he must try and adjust the proper dose for us, on scientific grounds. If he succeeds we will be his humble debtor, for we are sadly at variance with ourselves upon the subject.

Given, a diseased organ—a brain in a state of inflammation—or a nerve in the neuralgic condition. Query —what quantity of medicine will cure so as not to aggravate these states—the medicine to be chosen which most thoroughly simulates the disease in its action? Common sense instantly suggests that a very minute quantity will be sufficient. Homœopathists accordingly began with very small doses, which the aggravations produced compelled them to diminish. We have been *driven* from one degree of attenuation to another, astonished ourselves at these unexpected results of pure experiment. On what experience can the Allopathist base his answer to the above question? Homœopathy is not an invention, but a discovery. It brings new principles to light, and refuses to be tested by old ones. Homœopathic measures criticised upon Allopathic principles, must share the fate of the discovery of America—if the reality of that occurrence had to be determined by consulting the geography and atlas of Strabo or Pliny.

To combat the uncorrected prejudices of mankind

against the potency of infinitesimals, Homœopathists have taken great pains to adduce examples of powerful although exceedingly attenuated substances. Many of these possess the proper argumentative force, but some are fallacious and sophistical. As these, when detected, excite a distrust of the whole system in some minds, it will be well to sift them thoroughly and to cast them overboard, for Homœopathy needs no unwilling or incompetent witnesses to testify in its favor. The arguments drawn from the extreme tenuity of Heat, Light, Electricity, etc., are all based upon the corpuscular theories of these agents—theories which are only retained in school books for facility of illustration, having been entirely abandoned by the greatest scientific men of the age. To say, therefore, that a Homœopathic globule may be potent because a molecule of Heat or Light is potent, is a sophism—because no such molecule really exists. But a most plausible argument may be drawn from the infinitesimal delicacy of these undulations. From the correlations of Physical and Vital Forces, the existence, power, and inconceivable minuteness of nerve-undulations become highly probable. That Homœopathic molecules may modify these, comes entirely within the range of a very obvious probability—and such is the view I take of their action.

The morbid power of miasm or malaria, not to be detected by chemical analysis, is sometimes brought forward as a kindred example. But it is very probable that this malaria is a phantasm of the medical imagination. Production of disease by the absorption of a positive but intangible and undiscoverable substance in paludal regions, is by many considered a gratuitous

hypothesis. The derangement of functional equilibrium, produced by changes in those relations which earth, air, water, food, habits, etc., singly and collectively bear to the human body, is a much more rational ground of explanation. Dr. Bell, of the Ohio Medical College, ably advocates this view in Lecture 148th, of Bell and Stokes' Practice. However this may be ultimately decided, there is no occasion for Homœopathists to base any of their principles, or even their illustrations, upon ground disputed by a respectable minority of the profession.

An argument by analogy is sometimes drawn from the specific contagious diseases, such as small-pox and scarlatina. Here it is contended, there is a minute, invisible *materies morbi*, which is transmitted from one person to another, producing in every organism the same chain of morbid phenomena. If such infinitesimal particles produce the most fearful and complicated diseases, why may not Homœopathic attenuations act also upon the delicate organic tissues? The *materies morbi* at its inception and the Homœopathic drug are alike attenuated, but the parallel holds no further. The substance of small-pox in its minutest form possesses a wonderful and unexplained power of reproduction. From a single seed a hundred million may spring, and so a single molecule of the virus may saturate the blood with its destructive progeny. Whether the pathological changes are effected by cell-growth or by a species of fermentation, no similar action can be predicated of any drug. Such a striking dissimilarity between two substances must make all the coincident analogies comparatively valueless.

The tenuity of effluvia is frequently insisted upon as another support of the doctrine of infinitesimal potency. Here too we are apt to be imposed upon by deceptive appearances. It was once supposed that the vulture scented his prey at the distance of miles, which would involve an inconceivable tenuity of the decaying matter emanating from the carcass. But the Rev. J. Buchanan of Charleston, S. C., has demonstrated, by ingenious experiments, that the vulture is directed upon such occasions by the sense of sight alone. A grain of musk is said to scent a room for twenty years without losing its weight in any appreciable degree. It is difficult to believe that there has been a constant emanation of molecules from the surface of the musk. The fact suggests to me rather the plausibility of an undulatory theory of smell. The Physiology of that sense indeed is in a most obscure and unsatisfactory condition. We know that electrical excitation of the atmosphere produces a smell resembling that of phosphorus. Here the undulatory medium is obvious. When an odoriferous molecule falls upon the Schneiderian membrane, we know that an undulation is excited in the olfactory nerves, although the absolute contact of the two substances is a physical impossibility. The question then becomes, from what distance can scent-producing undulations be propagated through an atmospheric, ethereal, or some unknown medium? This distance may vary indefinitely, whether we consider the action of the same substance upon different animals, or of different substances upon the same animal. In the same occult class of phenomena, belongs that wonderful faculty by which a dog discriminates the footsteps of his mas-

ter from all others in a crowd. Dr. Carpenter tells also of a somnambulist who could distinguish the owner of a glove by scent alone in a party of thirty persons. I am convinced that there is some hidden element in these problems, quite independent of the hypothesis of material effluvia, not denying that there is frequently, nay always, an effluvial atmosphere around every natural substance.

Notwithstanding these deductions and others which might be made for the sake of scientific accuracy, Homœopathic writers have accumulated abundant evidence that matter by attenuation never loses its properties, that it can never be annihilated or become inert. After chemical analysis and artificial vision can no longer detect the particles, it is inconceivable that their potencies should be lost. They may not be now discoverable just as the Infusoria were unknown before the invention of the microscope. To a vastly extended visual power, the action of the thousandth attenuation upon the molecules of neurine might resemble the movement of a waterspout or a hurricane. It is well enough to adduce examples of this kind to prepare the popular mind for the reception of seeming anomalies, but really sublime truths. But I can not see that such illustrations are necessary to enlighten the minds of men who are acquainted with the present philosophy of matter and its forces. Mr. Robert Hunt, illustrating the connecting agency of gravitation, remarks: "so completely is all nature locked in the bonds of this infinite power, that it is no poetic exaggeration to declare, that the blow which rends any earthly mass is conveyed by successive impulses to every one of the myriads of

orbs, which are even too remote for the reach of telescopic vision." And La Place looking with this comprehensive spirit at the wonders of animal life, exclaims: "beyond the limits of this visible Anatomy commences another Anatomy whose phenomena we can not perceive; beyond the limits of this external Physiology of forces, of action, and of motion, exists another, invisible Physiology, whose principles, effects, and laws, it is of greater importance to know."

Many theories have been broached to account for the increased curative power of drugs, when in a state of extreme subdivision. It has been considered necessary to prove that the actual power of the drug on the living organism becomes greater, and hence the words potentization and dynamization have been stereotyped in Homœopathic literature. The spiritual school boldly overleaps the barriers of time and space, and maintains the immateriality of the disease, of the drug, and of the process of cure. "Fact shows that the attenuation of medicines may go on to such a point, and yet their curative properties be preserved, nay, hightened, that we are obliged to desert the hypothesis of their material action, and to presume that they take rank as dynamical things. A drop of aconite may be put into a glass of spirit, a drop of this latter into another glass of spirit, and so on, to the hundredth or the thousandth time, and still the aconite property shall be available for cure. Here then we enter another field, and deal with the spirits of things, which are their potential forms, gradually refining massy drugs, until they are likened to those sightless agents which are known to be the roots of nature, and feel as the most powerful in

ourselves." (Wilkinson on the Human Body, page, 372.)

From the whole tenor of this argument, or rather statement, I am inclined to dissent. Homœopathy, like all other forms of truth, must stand upon a physical basis, or it is no more than the unsubstantial offspring of a poet's imagination. I am not disposed to question the reality of spiritual forms and forces, but contend that they may be safely and indeed properly left entirely out of view in the consideration of our subject. I hold it to be axiomatic, that no possible attenuation of a material substance can transmute it into a spiritual entity, and moreover that spiritual forces do not and can not display their energies in this physical sphere of being, except through material media and by material laws. There is at least a material beginning of the action of diseases and of drugs, and if we can trace it to an abnormal nerve undulation, we will have made a most important step in Physiology and Therapeutics. The higher departments of Natural Physics and of Physiology are the most promising fields for Homœopathic laborers.

The material school believes that during the process of attenuation, the molecules of medicine, become potentised upon some physical principle. Electricity, Magnetism, and Odyle have been successively invoked for a solution of the problem. So uncertain is our knowledge of these agents, (and indeed the last named in my opinion has no existence whatever,) that I consider it worse than useless to base any hypothesis upon their assumed phenomena. The idea that *new* properties are developed by trituration and succession must

be unphilosophical, or we can place no reliance upon our experiments with crude drugs, which are similar in result to those made with attenuations. But the great appeal in favor of the increased energy of our medicines, is made on the score of the immense amount of medicinal surface obtained and presented to the living tissues. All actions, mechanical, chemical, or catalytic take place between surfaces, which, we are informed by natural philosophers, can never come into absolute contact. The whole material universe is a surface. What we call its interior parts are but the complex involutions of its infinite superficies. The more surface, the more action seems to be proverbial. This is the reason of the increased activity obtained by solution.

Mulder in his admirable work on the Chemistry of Vegetable and Animal Physiology—page 35—succinctly expresses the true rationale of this fact. "We should, I think, approach nearer the truth, by inverting our conception of the subject, and assuming, not that substances obtain a new power by subdivision, but on the contrary, that by their accumulation into masses they become powerless—that the forces present in molecules are prevented from acting, being reduced to a state of quiescence. When iron is in mass, it shows but a slight tendency to oxidation: but when minutely divided it can not possibly be brought even in contact with atmospheric air, at a low temperature, without becoming red hot, and at the same time being converted into an oxide. Cobalt, nickle, and uranium possess the same property. In the masses the chemical forces are rendered powerless and quiescent. If we could isolate the molecules of all the elements, their

and arteries. There is as great a variety in the action of forces would show their potency." This is the precise reason why platina, charcoal, oyster-shell, common salt, and other substances comparatively inert in mass are so powerful when divided. There is an immense difference in various substances in this respect. Some display their activities in aggregate form, and even by mere proximity, while others require the most forcible trituration before they begin to manifest their inherent powers. This fact has been strangely overlooked by those who sneer at our therapeutic use of some articles which vulgar opinion, from the continued fallacy of centuries, has pronounced inefficacious and indeed inactive.

The power of subdivision is generally acknowledged by the profession, and I am not inclined to push it further than incontrovertible facts will warrant. After a substance has been so thoroughly comminuted as to permeate with facility, all the capillary textures, beyond the reach even of the red globules, I believe that every further subdivision diminishes its real power of action. The point of greatest power must vary with the substance—but very generally after the second or third (frequently after the first) trituration—the power of the drug, in the common acceptation of the word, rapidly diminishes and soon, for all Allopathic purposes, entirely disappears. I say, in the common acceptation of the word, power; for the action of the drugs of the two Schools is based upon entirely different philosophies. A Homœopathic attenuation is more curative, because it is less potential in the ordinary manner. I believe the very object of attenuation should be, to procure the

drug in such a form, that while it shall retain its specific action, it shall exert that action in the least possible degree. Our drugs are like the still small voice, which is greater than the earthquake or the fire. They are like the soft answer, which turneth away wrath, and like woman, whose strength is in her weakness.

Entertaining these views, I mustdissent from those Homœopathic writers, whose tone implies that our medicines, by the processes to which they are submitted, are rendered almost as powerful as Allopathic doses. If each grain of the first trituration of Opium or Arsenic was carried with a hundred grains of sugar of milk to the second attenuation, and the ten thousand grains swallowed at once, death would be the probable consequence. This experiment would test the real increase of power by attenuation But one grain of the second possesses neither as much surface nor as much power as one grain of the crude article. The idea of dynamization has been pushed to an extent, improbable in itself, and entirely unnecessary to the establishment of a sound and consistent theory of Homœopathic Therapeutics.

A casual glance immediately detects the resemblance between the phenomena of disease and those of drugs in the human body. While the real *modus operandi* is equally occult, their effects are equally obvious and classifiable. Some drugs like some causes of disease produce convulsions, others paralysis, while another class occasion sundry mental aberrations, often met with as elements in the pathological condition. Some drugs diminish, others increase the action of the heart

drugs upon the alimentary canal as there is in the action of diseases on the same tube. So great is the similarity of these actions, that disease may be compared to a persistent drug action complicated with the reactions of the economy, and drug action may be called a transient disease. The effects of both drugs and diseases may radiate from their primary local centers, and involve to a greater or less extent the other living tissues.

I have already hazarded the hypothesis that, when emesis, catharsis, diuresis, diaphoresis, stimulation, sedation, etc., occur as pathological conditions, these phenomena are ultimately referable to abnormal nerve-undulations impinging upon the surfaces which display or reveal the morbid action. This idea was based upon a comprehensive physiological theory, that normal nerve undulations produce the natural changes which occur in the same tissues in their healthy condition. The consistent and indeed necessary inference from the facts of drug pathogenesis is, that the particles of drugs, like the causes of disease, create in the vesicular neurine abnormal nerve undulations, according to definite laws, which are propagated towards the peripheries where the symptoms or effects of diseases and drugs are alike to be found. And this I conceive to be the primary and fundamental truth with regard to the operation of all those drugs which do not act on purely mechanical or chemical principles.

Drugs which act mechanically or chemically evidently do so by modifying the organic media with which they come in contact. The passage of the nerve undulations through the distorted medium, and the return of modified or abnormal undulations in the ad-centric

direction are the true causes of what we call the morbid results. This must be the case whenever an anatomical disarrangement of structure is produced by mechanical pressure or by the chemical combination of the poison with the tissues. The presence of acids and alkalies in the primae viae as the products of disease, may prolong the disease by neutralizing the opposite and natural chemical product as soon as secreted, and before it discharges its functional use. Their removal by counteracting agents permits the recovery to progress, and is perfectly warrantable in the strictest Homœopathic practice. But he must be narrow-sighted to the last degree, who can suppose that he *cures* a disease when he merely neutralizes a chemical product of the disease.

The blood is the organizable medium by which the organic media are constructed by the Nerve Force. The nature of the workmanship depends here as well as elsewhere, on the quality of the material. Many of the phenomena of diseases and drugs are explicable by the modified condition of the blood, either in physical or chemical properties. The propriety of effecting a chemical change in the blood, as a remedial measure, stands upon nearly the same ground with that of its mechanical removal for a similar purpose. The latter means, although in my opinion not the bugbear which some Homœopathists represent it to be, need only be employed as a desperate resort, as in some cases of apoplexy and puerperal convulsions, by a physician who is possessed of the Homœopathic resources for combatting the inflammatory condition. Chemical Therapeutics appears to me to be valuable to the Homœopathist, mainly in the use of antidotes, and of

those dietetical agents which we know to exert an important influence over the composition of the solid structures of the body, and in the breaking up of certain diatheses.

I am willing to concede, that alkalies or mercurials may modify the condition of the blood, so as to prevent a plastic exudation at a diseased part. But as I am unprepared to deny that such a modification of the sanguineous mass may not be very deleterious to the rest of the tissues, it becomes me to inquire candidly, whether there are not means of preventing the exudation, by acting on the nervous instead of the circulatory apparatus. It is in the possession of such means that the Homœopathic superiority lies. The reader will find an interesting article on the Chemistry of Therapeutics, in the April and July Nos. of the British and Foreign Medico-Chirurgical Review, 1849. He will be impressed with the vagueness and uncertainty of the whole subject, and with the random character of a Therapeutics based upon such data.

A vast majority of drugs do not combine with the tissues, but are discharged by the emunctories, in very many cases entirely unchanged. Nevertheless, during their stay in the body, they produce marked pathological conditions, which more or less gradually subside after their removal. It is common to say that they act vitally or dynamically. This only makes "confusion worse confounded." The mind which can be cheated by such a mere verbality into believing that it has thereby made any addition to its knowledge, is too weak to be capable of seeing its own error when demonstrated. Before attempting to form some idea of

how these medicinal particles act, let us first inquire *where* they act, for the method of their action, may be partially determined by the nature and functions of the tissue they act on. There are but three suppositions, concerning the point of their action, which deserve any notice. They act on the sentient extremities of the nerves of the part with which the medicine comes in contact, without necessarily entering the circulation at all. Or they enter the circulation, and affect specifically some organ or tissue whilst permeating its molecular parenchyma. Or, lastly, they enter the circulation, and by acting on the nerve-centers produce all their disturbance in the organic peripheries.

It is quite unessential to the stability of our undulatory theories, whether medicinal impressions are made primarily on the peripheral nerves, or on the vesicular centers. But as it is a question of great physiological interest, I can not forbear giving it a brief consideration. It is astonishing how frequently and confidently medical writers allude to medicinal impressions upon the sentient extremities of nerves, when the mass of evidence lies against the supposition that any such impression is ever made at those points. Violent poisons, not acting chemically, may lie in the stomach for hours, entirely inert, if the venæ portanum be tied, so that the particles cannot be carried towards the nerve-centers. On the other hand, if the circulation be not obstructed, the effects are speedily produced, although the pneumogastrics of both sides have been cut. This experiment was repeated by Muller thirty times with the same result.

Sir Benjamin Brodie applied a strong ligature to the

hind leg of a rabbit, excluding only the nerves, and then inoculated the leg with woorara, one of the most rapid and energetic of all poisons. No poisonous effect whatever was produced, until the ligature was removed from the blood-vessels, when it almost immediately began to appear. I can conceive of no case more fatal than this to the theory of nervous transmission from the periphery to the center. Repeated experiments have shown that prussic acid produces none of its poisonous effects, when applied freely to nerves, if they are laid bare and isolated, so that there is no possibility of the substance getting into the circulation. Viborg applied almost a drachm of the concentrated acid to the outside of the brain of a horse, which had been trephined, without any ill result. Mr. Blake has shown that poisoning with prussic acid may be clearly referable to absorption into the blood and contact with the nerve centers. Nine seconds only are required to convey it from the capillaries of the tongue around through the heart to the brain. The same able experimenter asserts, moreover, that in his numerous operations he always found the action of the poison to vary in rapidity with the proximity to the nerve centers of the part into which it was introduced.

The strongest evidence ever brought against these facts, which might be greatly extended in number, is the experiment of Drs. Addison and Morgan, which was supposed to show, that the blood of a dog poisoned by strychnia, was not deleterious when injected into the arteries of a second dog. The fallacies of this experiment are satisfactorily pointed out in Pereira's Mat. Med. Vol. 1st, Page 139. Local anaesthesia, by opium

or chloroform does not militate against this view. These substances, by imbibition, reach the axis-cylinder of the nerves, which they locally modify, so that the usual undulations are not transmitted through the changed medium. Muller says that a solution of opium applied to a bare nerve destroys for a time its conducting power, but no opiate impression whatever, is made on the general system, unless the substance gets into the circulation.

The occurrence of tetanus in a most occult manner, after traumatic injuries, is sometimes appealed to in support of the doctrine of terminal impressions. But this, too, is an appearance easily explicable. A nail, splinter, or other rough substance produces a lacerated wound in a part well-supplied with nerves. After the repair of the injury, the coaptation of the tissues is not precisely such as it was before. As far as the muscles, blood-vessels, and similar textures are concerned, this makes no difference whatever. But the difference between the axis-cylinder before and after the injury, is like the difference between two pieces of glass, one of which, by the perfect regularity of its structure, transmits a perfect image of the object beyond, whilst the other, by its different molecular arrangement, produces various degrees of refraction and distortion. The returning nerve undulation passing through this modified medium, deviates more or less from the normal type, and, in certain constitutions, may produce a centric irritation, which is almost incurable. If this theory be correct, and it certainly is more plausible than that of a specific irritation originating in the periphery, division of the nerve would always prevent the

occurrence of tetanus, but, unfortunately, it can not be foreseen whether it will occur or not, and after the centric irritation is once established, the measure appears to be almost useless.

The idea that medicines act upon the gastric nerves, has been derived analogically from the evident impressions produced on the nerves of special sense by extraneous objects, all of which act mechanically or chemically, and upon all nerves by structural injuries. The question deserves thorough reconsideration. The nerve-animal, as the nervous system has been called, has two distinct elements in its construction. The first is intended for the conservation of its own material basis; the other for intercourse with an outer world. In some cases we know the latter portion terminates in a pointed or bulbous manner; the former, we have reason to believe, shows always a looped arrangement. The nerves sent to the stomach, like those sent to the testicle, are for the specific nutrition of the organ. They receive no direct impression at all, but communicate to the brain, what may be called metaphorically, a report of the organic condition of the stomach. Anything which structurally modifies the existing state of the viscera, mechanically, chemically, endosmotically, or otherwise, may through the medium of this modification disturb the centers. Independently of this, we have no unequivocal instance of a medicine producing its specific impression without getting into the circulation.

"Drs. Morgan and Addison have appeared in the field as mediators," says Dr. Paris, in his Pharmacologia, "and have proposed a theory with a view to

bring the disputants to terms. In order to reconcile the conflicting experiments of those who refer all the phenomena to absorption, and of those who maintain the exclusive agency of the nerves, they at once admit the entrance of the medicinal substance into the bibulous vessels, but instead of regarding the blood as the carrier or medium of transmission to remote parts, they consider the expansion of nervous filaments on the inner surface of the vascular system as directly conveying the medicinal influence. They thus admit the conducting power of the nerve, but insist upon the necessity of absorption as an accessory operation." How Drs. Morgan and Addison have bettered our uncertainties, I am at a loss to imagine. If a medicinal substance can make no impression on the nerves of the stomach, what reason can be given why it should readily affect the peripheral nerves of the arteries? The branches of the sympathetic, distributed on their internal coats, are designed to maintain their nutritive and functional activity. Moreover, the transmission of impressions by the sympathetic is slow, and if the decision depended only upon the question of time, it is much better to rely upon Dr. Blake's positive fact, of the great rapidity of the circulation which carries the medicinal substance towards the nerve-centers.

But the vast majority of drugs are slow in their action. There is ample time for their particles to permeate all the tissues of the body. Two facts are equally evident, that they are brought into contact with all the tissues, and that they do not primarily impress all, but indeed are quite limited in their action. Mercurials are supposed to stimulate the molecular parenchyma of the

glands, diuretics that of the kidneys, expectorants that of the respiratory passages, etc., by some special affinities and occult action, as the medicinal particles pass through those parts. There is perhaps no dogma in medicine so often and confidently promulgated by authors and professors, for which there is so little positive foundation. "It must be admitted," says Pereira, "that this theory, plausible as it may appear, can not be satisfactorily proved. We may adduce several arguments in favor of it, but absolute proof or demonstration can not be offered. Our facts mainly show the passage of medicinal particles into the blood, and the affection of remote organs; but the link which connects the two phenomena can not be, or at least has not yet been, demonstrated."

When a man swallows a cathartic and is purged, the vulgar inference is, that the action was local and irritative. The great fact that the medicinal particles are taken up into the blood, and brought into contact with the nerve-centers, whose modification in disease produces catharsis, is entirely overlooked. Sulphate of Magnesia may purge by endosmosis. Mechanical and chemical irritants may also act locally, and purgation be the result of the modified innervation. But when croton oil will purge when dropped upon the tongue, when castor oil will purge when injected into the veins, when colocynth will purge when applied to the surface of a blister, what right have we to presume that croton oil, castor oil, or colocynth ever do purge by local irritation of the intestines? The mere fact that they were in contact with the tissues is no more sufficient to prove it, than the fact that they were in contact with the

tongue and with the surface of the blister. But a broad and satisfactory basis for a theory of catharsis is found in the fact, that all the substances alike come into contact with nerve-centers, which govern the intestinal functions in health and modify them in disease. When these centers are diseased, as in tetanus, and their excitability expended on the voluntary system, these viscera become, in the words of an Allopathic physician, "so torpid as to bear the most enormous stimulation without danger of inflammation, the most enormous cathartics without the chance of purgation."

When nitre, alkalies, or turpentine are administered, diuresis occurs, and these same articles are detected in the urine, what ground is there for supposing that they produced the diuresis by direct irritation? Their presence in the urine is to be ascribed to the fact, that the kidney is the great natural emunctory by which a great deal of effete matter, and almost all medicinal substances, to whatever class belonging, are eliminated from the body. When the mental condition of fright alone, may through the nerve-centers produce copious diuresis, the advocates of local irritation must bring more positive proof of their doctrine than any they have yet advanced. A curious instance of this precipitate kind of reasoning is found in an inference, made by Dr. Percy, from the fact that much more alcohol was detected in the cranium in proportion to its mass than in any other part of its body. The imperfect miscibility of alcohol with the blood conjoined with its superior volatility will amply account for the fact to the reader, especially if he is familiar with the beautiful experiments made upon rabbits with ether by Professor Coze

of Strasbourg. Dr. Percy's inference was a pretty fair sample of the logical strength of a large portion of medical literature. It was, that "some *peculiar affinity* exists between the substance of the brain and the spirit." Sage conclusion! which might have been entirely reversed, had the subjects of his dissections been accustomed to walk upon their heads instead of their feet.

That the medicinal particles come into contact with the nerve-centers, is as unquestionable as that they come into contact with the organic parenchyma. This latter is a passive medium into which the Nerve Force from the former flows, as the really active and constructing agent. It is obviously improbable, that particles should make no impression on the nerve-centers, and yet display a specific action in the negative tissues, whose functional activity is derived from those centers. And when moreover, the supposition that the primary medicinal impression is excited at the nerve-centers (for which every provision is certainly made) is sufficient to simplify, harmonize, and account for all the phenomena, the inference that we have discovered the point of all primary medicinal action, not mechanical or chemical, is a rational deduction. The differences of drug action are then not so much to be attributed to the different susceptibilities of the tissues, as to the various properties of the vast number of neurine vesicles with which they come in contact. And difference of molecular arrangement, here as in all nature, must be the fundamental cause of difference of property.

In narcotic poisoning, emetics are tardy in their operation, not because the sentient extremities of the

gastric nerves are insensible to their impression, but because the centers are congested, and do not respond to the action of the particles of the drug upon them. When the nerves of any organ or viscus are divided, no medicinal substance can stimulate it into functional activity.* The cause lies, not in the want of a current from the organ to the center, but in the want of a positive and creative current of Nerve Force from the center to the organ. When nux vomica produces muscular convulsions, we assent instantly to the idea that it acted on the spinal centers. When calomel increases the secretions, physiological consistency demands a similar interpretation, and there is no unequivocal fact which opposes it. And it appears to me, that there is something accordant with the universal simplicity of natural laws, in thus giving to mental-action, disease-action, and drug-action, a common positive center in the vesicular neurine of the nervous system.

Having ascertained with a degree of probability which almost amounts to certainty, the true point of medicinal action, our next inquiry is, how does the medicinal particle affect the nerve center, so as to produce through its action the peripheral results. One says chemically, another electrically, a third magnetically, a fourth catalytically, a fifth dynamically, and the great majority say nothing at all about it. In attempting to discover the primary link in the chain of medicinal action we approach a *terra incognita*. Any first-course student can say that medicines act by reducing the heart's action, by promoting diaphoresis, by stimulating the liver, by exciting healthy action, by

allaying nervous irritation, etc. But these are merely secondary phenomena, which may be imposed as explanations on inquisitive patients, but can not be received by the educated physician as any thing but very vague and entirely provisional terms. It might as well be said, that small-pox acts by producing pustules, and epilepsy by producing convulsions. Very few systematic efforts have been made, to supersede this mere enumeration of the effects of drugs by a philosophical rationale of their primary action. This is a most inviting field to the speculative mind, and it can be no disgrace to fail, where nothing has ever been achieved.

To assure the reader that I have not misrepresented the real state of Allopathic philosophy upon this subject, I will quote from Pereira's Materia Medica, some remarks upon opium, which the learned author styles, "undoubtedly the most important and valuable remedy of the whole Materia Medica," and of which the profession has made so much use, that its opinion would be of immense value, were the mode of experiment on the sick at all calculated to discover the true action of drugs.

"The inquiry into the nature and kind of influence exercised by opium over system, presents an extensive field of speculation and hypothesis. Galen declared opium to be cold in the fourth degree, and his authority long prevailed in the schools. It was first opposed by the iatro-chemists, who declared opium to be of a hot nature. Some, however adopted a middle course, that it possessed both hot and cold particles. The iatro-mechanists endeavored to explain the opera-

tion of opium on mechanical principles. By some, expansion, by some, condensation of the blood was supposed to be produced by the mechanical properties of the opiate particles acting on nerves. Dr. Cullen considered opium to be a sedative, and referred its effect to its power of 'diminishing the mobility, and in a certain manner suspending the motion of the nervous fluid.' Several later writers, Barbier for example, also call opium a sedative. Brown declared it to be a stimulant, and his opinion has been adopted by Crumpe, Murray, Dr. A. T. Thomson, in this country, and of course by the continental Brunonians, as well as by the partizans of the Italian theory of contra-stimulus. Fontana ascribed the operation of opium to changes which it induces in the blood. Mayer declared opium to be both stimulant and sedative; viz: stimulant to the nerves and vascular system, but sedative to the muscles and digestive organs. Lastly—Orfila asserts, that 'opium, employed in strong doses, ought not to be ranked among the narcotics or the stimulants; it exerts a peculiar mode of action which can not be designated by any of the terms at this moment employed in the Materia Medica.' These examples, selected out of many opinions, will be sufficient to prove how little is really known of the real action of opium; and I believe we shall save ourselves much time and useless speculation, by at once confessing our ignorance on this point."

In a previous chapter, we adduced facts and analogies sufficient to warrant the inference, that the Nerve Force is an undulation of the axis-cylinder of the nerves, generated by the action of arterial blood upon vesicular

neurine. Carbonic acid in the blood, not only by a deleterious influence which it may have in itself, but by excluding the quantity of oxygen necessary for the nutrition of the centers, may partially or entirely arrest the undulations. Any substance, indeed, which causes the reactions between the blood and the vesicle to deviate in the least degree from their normal type, must necessarily modify the undulation starting from the center, and produce abnormal manifestations in the periphery. There is no evidence, whatever, that medicinal molecules take any chemical part in the reactions going on between the blood and the neurine, and the most violent medicinal actions may be produced and the medicine detected in the excretions, unchanged in quantity or quality. The mere presence of the drug then is sufficient to occasion the phenomena. And here we do not intend to fall back upon the phrases, excitation, stimulus, catalysis, etc., in their common significations, which are utterly void of explanatory value. No rationale can be more than fanciful or frivolous, which is not based upon the great universal fact, that all natural phenomena are the results of undulatory motions of molecular media, the motions being transferable from point to point, and their forms mutually converted into each other. In order to obtain a clue to such a rationale, let us consider what relations, if any, exist between the action of drugs, and their forms or molecular arrangement.

"The activity and kind of operation of most vegetable drugs, may be predicated from the structure and botanical connections of the plants from which they are obtained. Plants are grouped together from cer-

tain affinities of structure, and experience has established the general law, that when a group is a very natural one, the medicinal qualities of every member of it are very analogous. This appears to be grounded upon the fact of each containing active principles, either closely similar, or even identical in chemical composition and effects. The orders of Solanaceæ, Papaveraceæ, and Cruciferæ, illustrate this in the most satisfactory manner; the two former being narcotic and acting with varied energy on the cerebro-spinal functions, the latter containing plants constantly pungent and edible, either employed as articles of diet, or in ordinary use as condiments." Ballard and Garrod's Therapeutics, page 20.

"When we pass on," say the same authors, "to consider the chemical composition of these active principles, we obtain the singular result, that in several of those whose operation upon the nervous system is manifested in the most energetic manner, a certain similarity prevails, which arrives in some instances very close upon identity. We allude not so much to the relative proportions of their Carbon, Hydrogen, and Oxygen, as to their possessing a minute proportion of Nitrogen." When powdered rhubarb is exposed for sometime to sunlight, it loses it cathartic property. One simple substance may displace another of entirely different properties in an organic compound, without changing in the least the properties of the compound, provided its form or atomic arrangement is preserved. From these and similar facts, of which many might be collected, the probability, that drugs owe their peculiar action to their molecular constitution,

begins to be apparent. It becomes still more so, when we pass from the uncertain field of organic analysis to the more obvious and positive phenomena of the mineral kingdom.

Let us refer to a comprehensive critique in the Brit. and For. Med. Chir. Review—July, 1848—on Taylor and Copeland on Poisons. The reviewer has just been noticing the remarkable experiments of Prof. James Blake, and thus continues. "But it is justly remarked by Mr. Blake, that their results are not simply of a negative character: they do not merely prove that the reactions which take place in the living body are not to be explained by the common chemical properties of matter;—but they point to a new law, which shows, that under these circumstances, in which the ordinary properties appear to lose their application, a new and more latent property of matter comes into play, and exerts its influence over a most extensive series of phenomena. A comparison of the results, when these are properly classified, shows that the various substances may be arranged into groups, according to the similarity or dissimilarity of their effects: each group being distinguished by reactions not to be found in any other class, whilst the reactions of all its members closely resemble each other. The classes thus formed agree with those which are adopted by chemists in their arrangement of the different elements according to their isormorphous relations: and the only conclusion to be drawn from this interesting coincidence is, that *the physiological action of these substances depends upon some property they possess in connection with their isomorphous relations.*"

"Thus, (says Mr. Blake,) we find potash and ammonia agreeing very closely in the phenomena they give rise to; again we have strontia, baryta, and lead, all producing reactions nearly resembling each other, and all characterized by their influences on the muscular system. Soda and silver also agree very closely in the phenomena to which they give rise. We find then a very large family of substances, including lime, magnesia, zinc, iron, copper, manganese, nickel and cadmium, all producing effects which resemble each other, and distinguished from all other bodies by their action on the nervous system. Platinum, palladium, iridium, and osminum, readily arrange themselves in a distinct class, agreeing as they do with each other in most of their reactions: another well marked group is formed by phosphorus, arsenic, and antimony. Selenium and sulphur are found closely to resemble each in their reactions on the living organism: and between the remaining elements, chlorine, iodine, and bromine the most striking analogy exists in their physiological action.

This law has been arrived at by an experimental investigation of the physiological action of the compounds forming all the well-marked isomorphous groups: and in no instance has there been found an exception to it,—for the apparent exception which has presented itself by the separation of soda and silver from the potash group, I conceive to be owing to these substances having been united into one group on insufficient grounds: for, whilst the isomorphous relations between soda and silver are well-marked, and also between potash and ammonia, it still admits of doubt

whether any well-marked relations exist between the first two and the last two substances."

"Mr. Blake seems not aware (continues the reviewer) of the confirmation which his views derive from the experiments performed some years since by Dr. Daubeny on the absorption of mineral substances by the roots of plants. He found that if a plant naturally absorbs the compounds of any particular base, it will also take up those of another base which are isomorphous to them; for instance, most vegetables will absorb the salts of lime and magnesia with equal readiness. But salts however soluble, which have a crystalline arrangement different from theirs, (such as the salts of strontia,) are not absorbed. Although these facts themselves are of a different order, yet they agree with those brought to light by Mr. Blake's researches, in indicating a connection between the isomorphic relations of inorganic substances, and their action upon the living structure: and thus confirm his general conclusion.

Dr. Daubeny's experiments are quite in harmony with the general fact adduced by Mr. Blake as one of the deductions founded on the result of his experiments:—namely—that the substances which appear to exert the least injurious effects, or to produce the slightest change in the animal economy, when introduced directly into the blood, are those which either exist in the body as constituents of some of its fluids or solids, or which have isomorphous relations with some of these: whilst on the other hand, it is found that the substances which have no isomorphous relations with the elements of the body are those which are most fatal. Thus the compounds of arsenic which are isomorphous with those

of phosphorus, and the salts of silver which are isomorphous with those of soda, are examples of the first proposition: since they produce but very slight effects when injected into the veins even in large quantity. On the other hand, the very poisonous effects of palladium and baryta, which produce almost instantaneous death when injected in small quantities, are examples of the second."

These curious facts of Isomorphism have not escaped the attention of Homœopathic observers. Dr. Gray, in a note on Tartarus Stibiatus, in Jahr's Manual, points out the isomorphous relations of phosphorus, antimony and arsenic, as being intimately connected with their physiological and therapeutical actions. And he suggests that our knowledge of drugs may not only be corrected but increased by a study of crystalline texture. Professor Horsford of Harvard University, has recently presented to Silliman's Journal some interesting researches into the analogous effects of isomorphous substances upon the special senses. They are too partial and unsatisfactory to warrant positive conclusions, but they serve like the facts already given, to point out a general law, that the action of substances, upon the nervous system at least, is greatly and perhaps entirely dependent upon the molecular arrangement of the substance.

This, it appears to me, is the only fact yet discovered which promises to be really valuable in the construction of a rationale of drug-action. But where and how to make the proper application of it, are difficult questions. We might put the action of drugs on a purely mechanical basis, and coarsely represent it by the fall

of bodies on the surface of water. The geometrical figure and indeed all the characteristics of the waves produced would be determined by the size, weight, definite outline, etc., of the impressing body. A crystal of one hundred pounds weight and a fragment of the same weighing one-hundredth of a grain, create the same specific agitation, the difference being, not in the essential form, but in the length and velocity of the undulations. The undulations differ greatly in different diseases and in the different phases of the same disease. This might be adduced as the reason why the 3d attenuation will sometimes cure what the 1st or 30th would not, and *vice versa*.

But this explanation is entirely unsatisfactory. It is not the mere outline or superficies coming into contact, of course always approximative, with the neurine, which determines the result, but the *interstitial* molecular arrangement of the drug. Let us then compare our phenomena with others which are known to take place by what is called the action of presence. When a jet of hydrogen is thrown upon spongy platinum, the metal becomes red hot, and the gas takes fire. The idea, that some material substance which we may call Heat, passes from one of these bodies to the other, or is generated by their mutual but occult reactions, must be abandoned. The atoms of Hydrogen in passing into the metallic texture, become modified in their juxtaposition, so as to be in that state of undulatory motion, which we term Heat. If oxygen gas be present, the undulatory motions of the two gases mingle in such a manner as to generate a new form of undulatory motion, which we may call Actinism or Chemical Affinity.

The new atomic or molecular arrangement of the matter, makes on us new impressions, and we call the substance creating them, water. My illustration may not be aptly chosen, or correctly presented, but such is the general principle of explaining natural phenomena, which is becoming more and more demanded by scientific discovery.

During the reactions between the blood and the vesicular neurine, we must recollect, that convertible motions of the media concerned, constitute the physical basis of all the phenomena. The final result is, that a portion of vesicular neurine disintegrates, another portion is newly constructed from the blood, and a molecular motion is propagated down the nerve trunk. During these changes of animal matter, Heat, Electricity, Chemical Action, Magnetism, Nerve Force, and any other conceivable Force may have been manifested, if at any instant the molecular arrangement corresponded to the form of any one of these Motions or Forces. Now if a medicinal particle be present, these motions will certainly pass through it, and be modified by its structure, just as undulations of Heat, Light, Sound, etc., are variously modified by passing through different media. The result must necessarily be, that a modified nerve-undulation will be sent down the nerve trunk. In this theory there is "ample room and verge enough" to account for all medicinal actions, and it is remarkably confirmed by the similar operation of isomorphous substances.

Professor Gatchell, of the Western College of Homœopathic Medicine, makes a statement, deeply interesting in this connection, and which I would like to

see fully verified. "Medicines have been found," says he, "to exert their specific influence by means of a current of Electricity passed through the medicines to the person of the patient. In this way ipecac. will be found to produce emesis, colocynth catharsis, and so of all drugs, and all possible influences." Now according to Professors Grove and Carpenter's theory, when we say that an electric current is sent through the body, we mean that a peculiar state of undulatory motion, or as the chemists prefer to call it, molecular polarization, is induced upon the tissues. This undulatory motion is modified by passing through the medicinal molecules, just as the rays of Light are modified by any natural medium. If the point could be fully confirmed, it would be an invaluable addition to the strength of my theory.

The presence of foreign substances may thus arrest, increase, or prevent the nerve undulations, or it may have no effect at all. To illustrate the first of these actions in a forcible manner, I quote from the Lumleian Lectures (for 1845) by Sir G. Lefevre. "If one ounce of iodic acid, half an ounce of oxalic acid, and two ounces of water be mixed in a glass bottle, and be exposed together to a moderate heat (77° F.) and to the light of the sun, a process of combustion immediately commences. The oxalic acid is burnt, hydriodic acid is evolved, and after a short space of time, the whole of the oxalic acid is destroyed. The same results, but to a less degree, are produced when tartaric, lactic, and formic acids are used. If in any one of these acid solutions a drop of hydrocyanic acid is let fall, the whole process of combustion is arrested. The two acids henceforth exert no influence over each other, and the

mixture may be exposed for days and weeks to the action of the sun, and to a temperature of 60°, 80°, 100°, etc., (212° F.) without the slightest reaction taking place, or a particle of carbonic acid being evolved." These phenomena of course depend upon atomic changes and physical laws, and if we could trace the microscopic thread of the mystery, we might possibly explain the precise method by which hydrocyanic acid so instantaneously arrests all the molecular motions of the nerve-centers.

As matter can not be annihilated, I can conceive of no limit at which we can say that these actions, however imperceptible, cease to occur. A medicine in its minutest form, must retain the specific kind of action which diagnoses the crude article from all others. Those substances which are chemically changed by trituration or succussion can not be attenuated. Properties depend upon molecular arrangement, and the finest integral particles of Opium or Iron must retain that arrangement which gives Opium and Iron their individual significance. "It is considered a legitimate deduction of science," says Prof. Silliman, "that the crystals of bodies indicate the form of their molecules. The perfect symmetry and the constancy in every angle, exhibited not only in the crystal as a whole, but in the minutest particle into which it can be broken, must proceed from as perfect a symmetry and constancy of form in the constituent molecules of the crystal." From these considerations we are assured, that in using the thousanth dilution of Arsenic, we produce on the nervous system an action differing not in kind but in degree from the action of a whole grain.

But as it is always proper, when possible, to draw an illustration by analogy from the inorganic kingdom, in which the laws of nature are most easily and unquestionably detected, I will cite another fine example of Catalysis, or presence action, from Sir G. Lefevre's Lumleian Lectures, for 1845:

"The sesqui-chloruret of chrome, chemically pure and sublimated, is completely insoluble in water, either cold or boiling. It is equally insoluble in all acid solutions. It is not attacked by concentrated and boiling sulphuric, nitric, or nitro-muriatic acid. All of these are alike without effect on its combination, one of the most stable in the mineral kingdom. It is formed by $Chr.^2$ $Cl.^3$

"The proto-chloruret of chrome differs from the sesqui-chloruret by the abstraction of an atom of chlorine. It is represented by $Chr.^2$ $Cl.^2$ This second salt is highly soluble, and absorbs with the greatest avidity the oxygen contained in the air and the water to form the new product, $Chr.^2$ $Cl.^2$ O.

"A quantity, however infinitesimal, of the proto-chloruret of chrome, mixed with one million times its weight of sequi-chloruret, transforms this from an insoluble salt to a salt soluble in every proportion, if the proto-chloruret is pure: but if it has absorbed any portion of oxygen it becomes inert, and no longer alters the solubility of the sequi-chloruret.

"Here, then, is an example of a substance as nearly allied as possible in its chemical composition to a second substance, completely changing one of the most important chemical properties of that substance, even though mixed with it in infinitesimal proportions; and this

action is itself neutralized by the introduction into the poison (for the proto-chloruret is here, in reality, the poison of the sequi-chloruret) of an infinitesimally small quantity of oxygen."

Leaving behind us the bare chemical statements, and taking up into the vital sphere, the great universal law which must underlie all kindred facts, we might modify the paragraph thus. Here, then, is an example of a Homœopathic medicine—a material substance, as nearly allied as possible in its pathogenetic effects to an existing natural disease, (the disease and the drug producing similar abnormal nerve-undulations,) completely changing the important features of that disease—although applied to the diseased structures only in infinitesimal proportions. The last clause is also susceptible of a similar modification, for the action is neutralized by the introduction of an infinitesimally small quantity of another substance, which might disturb the relations existing, through the nervous system, between the drug and the disease. Hence the Homœopathic rule to prescribe but one article at a time, no union of similar and concurring drugs being permitted as in Allopathy. Hence also the rule to prohibit the use of stimulants, aromatics, perfumes, pungents, and indeed all articles which might make a sudden and perturbating impression on the nervous system. These precautions are subjects of merriment to those who have never learned that the practice of medicine, to the truly scientific, must be conducted with the delicacy of a chemical manipulation.

The extraordinary sensibility of the nervous system in some states of disease, may be fairly taken as a type

of the impressibility of a morbidly affected structure. The softest footfall may jar and shock like the report of a cannon. Objects in a dark room may appear to the patient, with thick compresses over his eyes, more brilliant than sunlight can ever make them to ours. The touch of a feather, or the mere sight of a shining substance may produce by reflex action the most appalling convulsions. An inflamed liver, or bladder, or trachea, does not manifest its sensibility in the same manner, because of its anatomical and physiological differences. It comes but vaguely into the circle of our consciousness, but it is not on that account less acute. A diseased organ may be compared to a fulminating powder, which will explode on the touch of a needle.

A dose, which might never affect a healthy man at all, even if given for years, might possibly operate almost instantaneously in the cure of disease. Nitric acid has not the least solvent power over platinum, but has a direct chemical relationship with silver. Now, if platinum be united with silver, the nitric acid will dissolve them both; so when a tissue is diseased a correlated attenuation may act upon the tissue. The cases are by no means identical, but truth becomes sometimes apparent in the glass of metaphor.

We come now to the disputed territory of medicinal doses. Professor Bartlett says, that "the sole true principles of medical science are those of a pure philosophical empircism." This I take to be nothing but a system of guessing in technical terms, and it is admirably illustrated by the Allopathic views of the *modus operandi* and doses of drugs. One physician declares Quinine to be a stimulant, and gives it by the

grain, or the fraction of a grain: another pronounces it to be a sedative, and administers it by the drachm. One gentleman gives calomel in very minute doses, and his compeer stuffs it down by the spoonful, each in pursuit of a different *ignis fatuus*, which he calls the indication. Some practitioners make one grain of tartar emetic, dissolved in several ounces of water, suffice for the drug-treatment of pneumonia; others give one or two hundred grains in the course of a few days. As general influences, which must be appreciated in graduating the doses of medicine Paris, enumerates, age, sex, temperament, constitutional power, habit, diet, profession, climate and season, nature and duration of the disease, time of the day, idosyncrasy, influence of imagination, and variable activity of the medicine. To these he might have added, that the quantity of medicine should also vary with the part to which it is applied, with the form in which it is given, and with the frequency of the repetition of dose. From these facts alone, we may see that there is a vast field for uncertainties, fallacies, inaccuracies, and speculations, in which "philosophical empiricism" may run riot.

The doses of medicine, even to effect a specific purpose in Allopathic philosophy, can never be fixed like the atomic weights of elementary substances. But, as *for Allopathic purposes*, one dose is too small, and another is too large, the adjustment of the dose becomes, in their eyes, a matter of vast importance. In Homœopathic practice, a medicine, by exciting nerve-undulations, similar to those of the disease, becomes curative, and is curative in proportion to the relation-

ship of similarity existing between the undulations. By increasing or diminishing the dose, we do not strike under or above the mark in the Allopathic sense, but the medicine is only *more* or *less* curative. If a physician wants to purge with rhubarb, he will find one grain insufficient, but if he wants to cure a certain species of diarrhea with rhubarb, the Homœopathic attenuations can only differ in their degrees of applicability to the case, all being more or less curative. Thence with the Homœopathic practitioner, the degree of attenuation is of as much or more importance than the quantity of the drug. The 200th dilution may cure more promptly and efficiently than the 30th, not because there is less medicine in it, but because the state of its molecular subdivision may so modify the nerve undulations in length, velocity, etc., as to obliterate the abnormal undulations existing.

Homœopathy insists upon a recognition of the well-established fact, that the form of a medicine is of vast importance independently of its quantity. Platina, oyster-shells, common salt, and other articles, inert when in their natural conditions, become eminently pathogenetic when subdivided. Mercury in mass, may be swallowed by the pound, with no other than the mechanical inconvenience. A single grain of the same substance triturated, becomes active, either to cause or to cure pathological conditions. The U. S. Dispensatory says, that twenty grains of the powder is a cathartic dose of Podophyllum Peltatum. Now, I took $\frac{1}{760}$th of a drop of the tincture, every two hours, until I had taken about the $\frac{1}{120}$th of a drop, when I was both purged and nauseated. Of what

positive significance, then, is the statement of the Dispensatory to my mind? If it means that *a* twenty-grain dose of P. P. will purge, it may be very true and available to a physician who intends to purge, but it should not convey the impression that it is *the* dose to purge.

If the molecular arrangement of a drug determines its specific action, then the effects of different quantities of medicine can only differ in degree. Appearances are so strongly to the contrary, that Paris makes an italicised assertion that the dose alone very frequently determines its specific action. The looseness of reasoning upon this subject is almost incredible. Let us take for instance the common dogma, that opium in small doses is stimulant, in large doses sedative. It would here be supposed the real *modus operandi* of the drug in the two cases was diametrically different, of which there is not a tittle of evidence. That opium ever is or can be stimulant in any manner or dose, I entirely deny. On what then is the dogma based? When a physician finds a case of nervous depression or anervation, as for instance in a certain stage of typhoid fever, and administers a small dose of opium, the patient revives and is much bettered. Having called the state of the patient depression, he calls the action of the remedy a stimulation. The truth most probably was, for the treatment is Homœopathic, that the nerve-undulations of the disease and of the drug mutually destroyed each other, and the natural functions resumed their play, there being no stimulation whatever in the case.

The term "secondary operation" is calculated to

mislead the mind, with the idea that the same drug acts specifically in two opposite ways, one succeeding the other. When constipation follows a cathartic, how unthinking is it, to call the constipation the action of the drug! The nerve-centers are abnormally modified and purgation results. The undulations then die away like the echoes of a sound or the gradually diminishing oscillations of a pendulum. Afterwards the natural undulations for the regulation of the intestinal canal are again created. In the interval constipation exists, and is ascribed to the drug, instead of to the state of the nervous system after the drug had ceased to act. Another frequent and prolific source of fallacy, arises from supposing that all the symptoms accruing from a large dose are to be attributed directly to the drug, no allowance being made for reflex phenomena. A substance may produce convulsions by irritating the alimentary canal, but it would be ridiculous to class it in small doses with cathartics and in large doses with nux vomica. In a large dose moreover, the rapidity and strength of action may be so great, that the intermediate steps are lost sight of, and false deduction is almost inevitable. If these facts are kept in mind during an analysis of drug action, it will be discovered, that the action of a drug may vary in degree but never in its type. Nor is this contradicted by the fact, that Allopathists may use different quantities of the same drug for quite different purposes and that too with tolerable success.

"It would appear," says Paris, "that powerful dose are disposed to produce local rather than general effects. Experience seems to prove that in this respect,

the effect of an internal remedy is analogous to that of an external impression: if violent it affects more particularly the part to which it is directly applied, as pinching does that of the skin; whereas titillation which may be said to differ from the former only in degree, acts upon the whole system, and if long continued, would even occasion convulsions. Upon a similar principle, if a large dose of the mercurial pill be given, it will act upon the bowels and be eliminated from the body: whereas in smaller doses it will affect the system generally, to the most minute ramifications of its capilaries." This fairly illustrates the reason why a small dose of medicine acting more generally than a large one is better calculated to arrest disease which is always a diffused or general abnormal condition.

In this rationale of drug-action I have limited my view to the phenomena going on at the nerve-centers, only because the evidence we now possess appears to my mind to limit the true drug action to those centers. The theory of pathogenesis and cure would be equally applicable to the facts, if they proved that all drug-action was effected in the peripheral structures. I hope I have adduced sufficient evidence to lead the candid Allopathist, not only to distrust the common views of medicinal action, but to give a liberal range to the probabilities and possibilities of our Homœopathic philosophy. When medicines attenuated into a form never before known or used, are brought into contact with living tissues of such variety of structure and functions, with respect to which our real knowledge is so very limited, and when moreover the principle of application is as novel as the method, the properly

trained mind will not venture to affirm what will or will not happen. It will keep all previous experience in abeyance and commence *ab initio* the simple and unprejudiced work of observation. When this obviously rational process is refused, and the mental labor expended in sarcasm which should be employed in research, I can only attribute the apathy and incredulity to an overweening confidence in the accuracy of knowledge and in the stability of opinion, which is not warranted by the past history or the present condition of Medical Science.

UNDULATORY THEORY OF CURE.

The reader who has comprehended the nature and scope of my effort (whether it has succeeded or not) to bring an undulatory theory to bear upon the most abstruse questions of Physiology and Pathology, will not be astonished at the caption of the present essay. He will recognize the natural and necessary relation of the conclusion to the premises. But he will do these opinions, or rather suggestions, great injustice, if he confounds them with those of the iatro-mathematical physicians of the seventeenth and eighteenth centuries. That medical sect was founded by Borelli and supported by Bellini, Sauvages, Pitcairn, Mead, and other distinguished men. The great John Locke assented strongly to the rationality of their views. The functions of the body, the production of disease, and the operation of medicines, were explained by them on mathematical principles. For instance, stimulants were supposed to excite by their acicular or needle-shaped atoms, and emollients to soothe by their globular structure.

A precisely similar theory of Cold and Heat, which were thought to be corpuscular forces, had been proposed a long while before. The assertions and hypotheses of the school soon fell into merited oblivion. They had, however, one great element of truth, viz:

the idea that mechanical and indeed mathematical principles must ultimately underlie all the phenomena of nature. But their conceptions of the subject bear no more resemblance to those I have presented, than the ancient philosophy of Heat and Light bears to our beautiful and wonderful undulatory theories of these agents, or rather motions. These motions are now known to be the legitimate object of mathematical analysis, and the sublimest of all the applications of mechanical philosophy, viz: to the solution of physiological enigmas, is still left for the ambition and the labor of future inquirers. And it presents to the scientific traveler no "pent up Utica," but a glorious and interminable vista.

We understand the meaning of angular, circular, elliptical, spiral and vortical fluxions, when their figures stand before us in isolated diagrams, but we shrink with a sense of our incapacity from unraveling the Gordian knot, which their thousand fold combinations, more inexplicable from their inscrutable minuteness, make in an organic structure. But in their analysis lies the only hope (never to be realized with our present dull and narrow powers of perception) of grasping in its true bearing the sublime idea of vitality. For life is specific motion generated and maintained in the compound, by an orderly and wonderful interweaving of the subordinate motions, which govern the integrals. Every organ—indeed every cell—is a center to which the rest of the system is a periphery, and is at the same time a point in numberless peripheries of which other organs and cells are the centers. This mode of looking at natural phenomena will lead us to the great concep-

tion of the illustrious Faraday—that the material universe has essentially a mathematical being, with points of activity and lines of motion. Such abstruse speculations need not and do not interfere with our practical knowledge and use of those arts and sciences which make the laws of nature the ministers of our wishes or our wants. The undulatory theory of function and disease can not impede but must facilitate our methods of cure, by giving them a proper physical basis.

Geometricians tell us that the circular form is infinitely angular, the spiral infinitely circular, and the vortical infinitely spiral. The descent, breaking up, or resolution of the vortical is into the spiral, of the spiral into the circular, and of the circular into the angular. The higher form includes the lower, and may be, as it were prismatically, broken up into its component elements. Similarly I have supposed the motions or potentialities of the Nerve Force to be resolved into all the vital motions. The circulation of the blood, the general and special movements of muscles, the molecular changes of form in every tissue, are but its subordinate, inferior and local manifestations. The normal action of this complex series of motions is health, its aberration is disease, its cessation is death. For the first condition, there must be an equilibrium between all the parts, an equilibrium between the forces of the body and the forces of nature, and a still more occult equilibrium between the mind and the body. Any disturbance of these equilibria is propagated from one point to another, so as to produce all the vast variety of morbid phenomena. The initial step of these processes, is an abnormal nerve undulation, and it will always be the last

possible result of our physical analysis. In a rational therapeutics it is to this that we must address our measures.

Our first effort is, of course, to remove the causes which have originated this abnormal undulation. If it be from a depressed bone, we elevate it—if from a chemical element in the blood or elsewhere, which we can antidote, we antidote it—if from the accumulation of worms or pressure of a tooth on the gums, exciting reflex action, we obviate mechanically these mechanical causes. Frequently the cause is a morbid condition of the blood, which generates the undulation during the process of nutrition, at the points of exchange between the capillary vessels and the vesicular neurine. Hygienic and medicinal measures may then do but little toward the *cure* of the disease. Some causes, for example that of small-pox, persist for a certain time and with certain anatomical lesions, in spite of all our local, palliative and temporizing agents. The most we can do is to moderate the pathogenetic action, and prevent any complication, not essentially a part of the disease. Some causes are very transient, for instance cold, but the changes they produce act as more persistent secondary causes. Many causes of disease are, however, entirely and hopelessly occult, so that we have nothing but the symptoms as objects of study.

All possible means of removing the cause of the abnormal nerve undulation having been adopted, we next consider some method of changing it to a healthy one, or at least of modifying it so that it shall no longer produce its pathogenetic effect in the peripheries. We have no power to simulate or produce artificially the

natural undulations. But we have in drugs a vast storehouse of remedial treasures, provided by a beneficent Providence, which create abnormal undulations similar to those of the disease. However paradoxical it may seem, all therapeutics is pathogenetic. But it is a very loose and unphilosophical way of stating the facts—to say that one disease cures or is substituted for another. The mind forms no conception from such a proposition, of the relation between cause and effect. And the obscurity will remain unpenetrated until we bring to our aid the correlative points between Physical and Vital Forces.

I have labored to show the correlation of the Nerve Force with the more familiar and analyzable forces of matter. If a certain law can be shown to govern all the known undulatory motions of nature, the application of that law to the Nerve Force is clearly admissible. This law, upon which I base the rationale of Homœopathic cures, is known as the *law of interference*. It states the fact that, under certain circumstances, two waves of water annul each other, two waves of sound produce silence, two undulations of Heat, Light, and Tithonism or Chemical action, produce respectively cold, darkness, and no action whatever. I believe that upon the same principle two abnormal nerve undulations destroy each other, and of course the morbid states in the peripheries or the symptoms of disease, disappear. The law is so universal and its phenomena so positive, that I shall illustrate it freely by quoting from Mrs. Somerville's Connection of the Physical Sciences, a most admirable synopsis of the present views of the greatest scientific men.

Interference of tides. "These perpetual commotions in the waters are occasioned by forces that bear a very small proportion to terrestrial gravitation: the sun's action in raising the ocean is only the $\frac{1}{11111111}$ of gravitation at the earth's surface, and the action of the moon is little more than twice as much: these forces being in the ratio of 1 to 2.35333, when the sun and moon are at their mean distances from the earth. From that ratio the mass of the moon is found to be only $\frac{1}{75}$ part of that of the earth. Had the action of the sun on the ocean been exactly equal to that of the moon, there would have been no neap tides, and the spring tides would have been twice the hight which the action of either the sun or moon would have produced separately: a phenomenon depending on the interference of the waves or undulations.

A stone plunged into a pool of still water occasions a series of waves to advance along the surface, though the water itself is not carried forward, but only rises into hights and sinks into hollows, each portion of the surface being elevated and depressed in its turn. Another stone of the same size thrown into the water near the first, will occasion a similar set of undulations. Then if an equal and similar wave from each stone arrive at the same spot at the same time, so that the one exactly coincides with the elevation of the other, their united effect will produce a wave twice the size of either. But if one wave precede the other by exactly half an undulation, the elevation of the one will coincide with the hollow of the other, and the hollow of the one with the elevation of the other: and the waves will so entirely obliterate one another, that the surface

of the water will remain smooth and level. Hence if the length of each wave be represented by 1, they will destroy one another at intervals of $\frac{1}{2}$, $\frac{3}{2}$, $\frac{5}{2}$, etc., and will combine their effects at the intervals 1, 2, 3, etc.

It will be found according to this principle, when still water becomes disturbed by the fall of two equal stones, that there are certain lines on its surface of a hyperbolic form, where the water is smooth in consequence of the waves obliterating each other: and that the elevation of the water in the adjacent parts corresponds to both the waves united. Now in the spring and neap tides arising from the combination of the sololunar waves, the spring tide is the joint result of the combination when they coincide in time and place: and the neap tide happens when they succeed each other by half an interval, so as to leave the effect of their difference sensible. It is therefore evident that if the solar and lunar tides, were of the same hight, there would be no difference, consequently no neap tides, and the spring tides would be twice as high as either separately. In the port of Batsha, in Tonquin, where the tides arrive by two channels of lengths corresponding to half an interval, there is neither high nor low water, on account of the interference of the waves." (Page 92.)

Interference of atmospheric undulations. "The laws of interference extend also to sound. It is clear that two equal and similar musical strings will be in unison, if they communicate the same number of vibrations to the air in the same time. But if two such strings be so nearly in unison, that one performs a hundred vibrations in a second, and the other a hundred

and one in the same period, during the first few vibrations, the two resulting sounds will combine to form one of double the intensity of either, because the aërial waves will sensibly coincide in time and place; but one will gradually gain on the other till at the fiftieth vibration it will be half an oscillation in advance. Here the waves of air which produce the sound being sensibly equal, but the receding part of the one coinciding with the advancing part of the other, they will destroy one another and occasion an instant of silence. The sound will be resumed immediately after, and will gradually increase until the hundredth vibration, when the two waves will combine to produce a sound double the intensity of either. These intervals of silence and greatest intensity, called beats, will occur every second: but if the notes differ much from one another, the alternations will resemble a rattle; and if the strings be in perfect unison, there will be no beats, because there will be no interference.

Thus, by interference is meant the co-existence of two undulations of which the length of the waves are the same. And as the magnitude of an undulation may be diminished by the addition of another transmitted in the same direction, it follows that an undulation may absolutely be destroyed by another when waves of the same length are transmitted in the same direction, provided that the maxima of the undulations are equal, and that one follows another by half the length of a wave. A tuning-fork affords a good example of interference. When that instrument vibrates, its two branches alternately recede from and approach one another; each communicates its vibrations to the air,

and a musical note is the consequence. If the fork be held upright, about a foot from the ear, and turned round on its axis while vibrating, at every quarter revolution the sound will scarcely be heard, while at the intermediate points it will be strong and clear. This phenomenon arises from the interference of the undulations of air coming from the two branches of the fork. When the two branches coincide, or when they are at equal distances from the ear, the waves of air combine to reinforce each other; but at the quadrants, where the branches are at unequal distances from the ear, the lengths of the waves differ by half an undulation, and consequently they destroy one another." (Page 133.)

Interference of luminous undulations. "When two equal rays of red light, proceeding from two luminous points, fall upon a sheet of white paper in a dark room, they produce a red spot on it, which will be twice as bright as either ray will produce singly, provided the difference in the length of the two beams, from the luminous points to the red spots on the paper, be exactly the 0,0000285th part of an inch. The same effect will take place if the difference in the lengths be twice, three times, four times, etc., that quantity. But if the difference in the length of the two rays be equal to one half of the 0,000020th of an inch, or to its $1\frac{1}{2}$, $2\frac{1}{2}$, $3\frac{1}{2}$, etc., part, the one light will entirely extinguish the other, and will produce absolute darkness on the paper where the united beams fall. If the difference in the lengths of their paths be equal to the $1\frac{1}{2}$, $2\frac{1}{2}$, $3\frac{1}{2}$, etc., of the 0,0000285th part of an inch, the red spot arising from the combined beams, will be of the same intensity which one alone would produce.

If violet light be employed, the difference in the length of the two beams must be equal to the 0,0000157th part of an inch in order to produce the same phenomena; and for the other colors, the difference must be intermediate between the 0,0000285th and the 0,0000157th part of an inch. Similar phenomena may be produced by viewing the flames of a candle through two very fine slits in a card exceedingly near to one another; or by admitting the sun's light into a dark room through a pin hole about the fortieth of an inch in diameter, receiving the image on a sheet of white paper and holding a slender wire in the light. Its shadow will be found to consist of a bright white bar or stripe in the middle, with a series of alternate black and brightly colored stripes on each side. The rays which bend round the wires are of equal lengths in the middle stripe; it is consequently doubly bright from their combined effects; but the rays of light which fall on the paper on either side of the bright stripe, being of such unequal lengths as to destroy one another, form black lines. On each side of these black lines the rays are again of such lengths as to combine to form bright stripes, and so on alternately until the light is too faint to be visible. That the alternation of black and colored lines actually does arise from the mixture of the two streams of light which flow round the wire, is proved by their vanishing the instant one of the streams is interrupted.

Now it is contrary to all our ideas of matter to suppose that two particles should annihilate one another under any circumstances whatever; while on the contrary two opposing motions may, and it is impossible not to be struck with the perfect similarity between the

interferences of small undulations of air and of water, with the preceding phenomena. It is clear that the the alternate stripes of light and darkness are entirely the effect of the interference of the undulations; for by actual measurement, the length of a wave of the mean red rays of the solar spectrum is equal to 0.0000285th of an inch: consequently when the elevation of the waves combine, they produce double the intensity of light which each would do singly: and when half a wave combines with a whole, that is, when the hollow of one wave is filled up by the elevation of another, darkness is the result. At intermediate points between these extremes, the intensity of the light corresponds to intermediate differences in the length of the rays." (Page 161.) I may add that these phenomena are entirely inexplicable on the old corpuscular theory of the imponderable agents.

Interference of Calorific undulations.—"It appears from various experiments of M. Melloni and Professor Forbes, that all the Calorific rays emanating from the sun and terrestrial objects are equally capable of being polarized by reflection and by refraction, whether double or simple, and that they are also capable of circular polarization by all the methods employed in the circular polarization of Light. Since Heat is polarized in the same manner as Light, it may be expected that polarized Heat transmitted through doubly refracting substances, should be separated into two pencils, polarized in planes at right angles to each other; and that when received on an analyzing plate they should interfere and produce invisible phenomena perfectly analogous to those described with regard to Light.

Professor Forbes has found that this is really the

case, whether he employed Heat from luminous or non-luminous sources; and he had evidence also of circular and elliptical polarization of Heat. It therefore follows that if Heat were visible, under similar circumstances we should see figures perfectly similar to those given in Note 207, and those following; and as these figures are formed by the interference of undulations of Light, it may be inferred that Heat, like Light, is propagated by undulations of the ethereal medium, which interfere under certain conditions, and produce figures analogous to those of Light. It appears also from Mr. Forbes' experiments, that the undulations of Heat are probably longer than those of Light." (Page 217 ——.) The authoress elsewhere positively asserts that the interference of two rays of Heat must produce cold.

Interference of Tithonic rays, etc.—Beyond the violet rays in the solar spectrum we find invisible radiations, which we recognize only by their producing chemical changes. These rays have been proved to be physically independent of Heat and Light. The composition and decomposition of those solids, liquids, and aeriform fluids hitherto attributed to Light, are chiefly owing to this principle, and as precisely similar chemical changes may be produced by currents of Electricity, a connection between these two imponderable influences is clearly shadowed out. "The Tithonic or chemical rays are emitted, and undergo reflection, refraction, and polarization, precisely in the manner of Heat and Light. Unlike the former principle, they exhibit no phenomenon of conduction; the effect which they produce does not pass from particle to particle, but is limited to that on which the light has impinged; nor

is it, as yet, distinctly established that they exhibit any phenomenon analogous to secondary radiation. An object upon which rays of Heat fall, as it becomes warm, radiates back again, but a substance on which Tithonic rays are impinging does not radiate in like manner. In the sunbeams Tithonic rays exist abundantly; I have also found them in the moonlight, in sufficient quantities to give copies of that satellite on sensitive surfaces. In lamplight and other artificial Light, they also occur to a much greater extent than is commonly supposed." (Draper's Chemistry, page 91.)

The amount of their decomposing effect is always exactly proportional to the quantity of rays absorbed. The Tithonic ray has one peculiarity: when hydrogen and chlorine combine under its influence, that portion of the ray which passes through the mixture has lost the quality of ever bringing about a like change again; the mixture is tithonized and the Light detithonized. These chemical undulations have many remarkable points of affinity with the nerve undulations—particularly with those belonging to the sympathetic or ganglionic system, while the undulations of voluntary and conscious life more nearly resemble Electric phenomena. Now Dr. Young, M. Arago, and others, have demonstrated the fact, that these chemical undulations, like all others, are subject to the laws of interference, so that with suitable apparatus we may get from the same rays alternate lines of action and of no action.

The same great truth is dimly traced in electric and magnetic phenomena, and is not more apparent, only because the forms of the motion have become more intricate, and our modes of research and instruments of

analysis less and less serviceable. But when we recollect that Force is matter in motion, that remarkable points of affinity, and indeed identity, exist between each Force and all the others, and when we find a definite law uniformly and thoroughly pervading all the motions which we have yet analyzed, we have a right to extend that law, with all its consequences, to kindred motions, all the known phenomena of which are so intimately correlated with our familiar Forces. The same reasoning applies equally to the consideration of the Nerve Force. The motions here are so complicated and infinitesimal, as to be quite beyond the reach or hope of analysis. But in this case, analogy, so frequently the parent of error, is the index finger of truth. The already recognized correlations between the Physical and Vital Forces encourage us to anticipate the discovery of still more distinct relationships, and a law so thoroughly manifested in one class of these phenomena, may be safely hypothecated to extend into the other. It has been beautifully said, that with all the improvements and discoveries of the present century, we are still shut in a dark chamber, through the crevices of which, some rays from the great world without have penetrated. These it is our duty to study and analyze, and from them we must form our conceptions of the undiscovered and probably undiscoverable phenomena of which they are a fractional part, and from which our visual power is excluded.

In the undulatory philosophy of the Nerve Force, a thousand and one unsettled questions may continue to harass us, but the laws of interference stand prominently forth as a beacon for all practical purposes. The

symptoms of the disease, and the symptoms of the drug, are the only exponents of the character of the undulations which each produces. No drug produces any one of the definite diseases we find described in the books, but with the articles we already possess, we can produce a pathological condition, bearing a striking resemblance to most of the phenomena which may occur at any one time in any disease. When under such circumstances we apply the drug, the undulation created at the nerve-centers, either simultaneously or soon after the abnormal undulation of the disease, destroys this latter, whether it overtakes or is overtaken by it, or whether interference occurs in their *nascent* condition, before leaving the neural vesicle to traverse the axis-cylinder.

Mutual destruction on one hand, and conjunction of force on the other, are the extremes. Between these may be many degrees of interference, so that the force may be only partially destroyed, and a modified undulation still remain. Therefore, one medicine may do what another has left undone, and a fourth or fifth article may be the complement of three or four which have preceded it. This gives a physical reason for the fact so well known to Homœopathic practitioners, that some medicines are much more serviceable when used after certain others. The necessity for the use of but one medicine at a time becomes also obvious. With our present knowledge we may safely say, that the extremes are seldom produced. It is not often that violent aggravations are occasioned, nor is it frequently the case that relief is instantaneous, as it would be from a perfect interference. Relief, however, is so sudden, in

comparison with any thing ever witnessed in Allopathic medication, that nothing so well as these laws of interference can explain the result. I have repeatedly seen pains of the most violent character, tooth-ache, neuralgia, head-ache, colic, etc., disappear in from five to fifteen minutes When they return, as they sometimes do, for the annulling undulation gradually loses its effect when the article is removed from the blood, the remedy as promptly relieves again.

We see by all the examples I have adduced, that identity of undulations is undesirable. Hence Homœopathy must be distinguished from Isopathy. A purely isopathic action must be always aggravative. For this reason the use of variolin for small-pox, of syphilin for syphilis, hydrophobin for hydrophobia, have not gratified the expectations of Homœopathists. These articles may sometimes do good, because in various individuals and in various phases of the disease, the undulation of the disease may cease to be identical with that of the drug, and then the "similia similibus" would be the acting and of course the curative principle. But when we have any reason to believe, that a purely isopathic action will result, the proper line of conduct is evident. Therefore we do not use opium in cases of poisoning by opium, which Allopathists would consider necessary to be consistently Homœopathic. We refrain from it in order not to be isopathic. When we have given opium medicinally, and wish to produce some other action, we first antidote the opiate impression by Belladonna, Hyosciamus, Stramonium, or some other congeneric drug. Allopathists have often observed, that the mixture of congeneric drugs, for example cathartics, calo-

mel, jalap, colocynth, aloes, etc., acts more efficiently and still less harshly than would have been expected from the known properties of each ingredient in the dose. This I consider to be due to the fact, that a great many abnormal nerve undulations created by such similar articles destroy one another.

When the symptoms of disease are severe the repetition of the dose is more frequently demanded. This is because the agencies which produce the abnormal undulations are still at work, and unless these are antidoted or obliterated before they reach the peripheries, they will go on to the production of various organic lesions and complications. We give the proper medicines on nearly the principle upon which we keep up artificial respiration in narcotic poisoning, until the substance has been removed by the emunctories. We keep continuously antidoting the cause until its action ceases. But although constantly diminishing like the oscillations of a pendulum or the echoes of a bell—the medicinal undulations may be perpetuated for a long while. Therefore in chronic cases—in which no powerful and rapid undulations calling for constantly renewed impressions exist—the medicine is allowed to act during a considerable interval. When we consider the microscopic delicacy of the nervous tissues, their inconceivable impressibility, and especially the physiological law of the propagation of modified form by assimilation for considerable periods of time, the long continued action of drugs not only ceases to be incredible, but becomes obviously rational. The fact is equally applicable to Allopathic medication, and indeed accounts for many Homœopathic failures upon adults, whose organic tis-

sues have been saturated with medicinal matter. Every practitioner knows how readily infants are benefitted by Homœopathic treatment, and Homœopathy can never do its perfect work until it gets a chance of being tested upon undrugged generations of men.

Some diseases, with rare exceptions, occur but once in the life of the individual. This remarkable immunity is one of the most obscure problems in pathology. On this subject Mr. Paget hazards an ingenious hypothesis. "The poison of small-pox or scarlet fever, being once inserted, soon, by its multiplication or otherwise, affects the whole blood and alters its former constitution; then the disease in a definite form and order pursues its course, and finally the blood recovers to all appearance the former state. Yet it is not as it was, for now the same material, the same variolous poison, will not produce the same effect upon it, and the alteration thus made in the blood or in the tissues is made once for all; for commonly through all after life, assimilation never deviates from the altered type, but reproduces particles exactly like those altered by disease: the new ones therefore like the old are incapable of alteration by the same poison, and the individual is safe from the danger of infection. Unsearchable as the changes produced even by vaccination may be, inconceivably minute as the difference must be between the blood before and the blood after vaccination, yet in many instances the difference is perpetuated, in nearly all it is long retained, for by assimilation the altered model is precisely imitated, and all the blood thereafter formed is unsusceptible of the action of the vaccine matter."

A great and true principle underlies these remarks, but the reference of the change which is propagated by assimilation to the blood, appears to me entirely unwarranted. The blood is not an organized substance but an organizable material. It is daily, hourly, yea instantly changing its constitution and its molecular arrangement by the addition and subtraction of elements. I can conceive how an image or impression of any kind may be made upon stone and wood, and perpetuated indefinitely, but on water or air, or any substance in constant mobility—it appears to be impossible. Besides the idea was taken from phenomena observed to take place in the solid or organized structures of the body, which amid all the waste and supply of matter retain their molecular form. A cicatrix for instance we know to be perpetuated by assimilation. The law should be logically restricted to the tissues of the body—for in tissues alone its operation has been observed. If we limit the perpetuated assimilation to the peripheries, small-pox would give a man subsequent immunity only from the pitting and cutaneous inflammation. The particles of variolous poison still circulating in the blood might readily produce functional and constitutional derangement through the nerve-centers. This brings me to observe that Mr. Paget's hypothesis acquires a most valuable significance, whenit is applied to the right point, viz: the nerve-centers.

Let us suppose an infinitestimal change is impressed by vaccination upon the vesicular neurine, so that it is perpetuated by continual assimilatiou—just as a cicatrix is upon the skin. The result is that what may be called a vaccine undulation is constantly traveling the

nerves, without interfering as experience shows with their natural functions. Now further suppose this body exposed to the contagion of small-pox. The particles of variolous poison are taken in the blood as in other individuals, but as I have already contended—they can not act in the blood or in the tissues except through impressions made upon the nerve-centers. The poison impresses a protected just as it does an unprotected person, what we may call small-pox undulations being generated in the nerve-centers. The small-pox undulation must be similar to the vaccine undulation, although not identical with it, because the anatomical lesions of the two viri as seen in the pustules are remarkably analogous. The undulations will therefore interfere with and neutralize each other, leaving the peripheries in their normal condition, and this may happen as often as repeated. Vaccination and the modified state of the centers after small-pox, are consequently Homœopathic conditions of body—by which a similar disease is warded off. If the vaccine matter was not very good, or if so long a time has elapsed, that the assimilation has lost the perfection of its character—the undulation deviates from the line of absolute obliteration, and the person may contract the disease in a modified form—such as varioloid. Such appears to me to be the true relation of these curious phenomena to Homœopathic philosophy. Similar reasoning may be applied to the state in which all the only once recurring contagious diseases leave the apparatus of life. Similar antagonistic modifications may exist in the system, when it becomes tolerant of articles which were at first both dangerous and repulsive—such as

opium, tobacco, and alcohol. On the same principle we may explain the prophylactic power of belladonna with regard to scarlet fever.

It might appear at first that this mutual obliteration of the undulations would leave the axis-cylinder in a motionless condition, so that no functional changes could be carried on in the peripheries. But this would be taking a most contracted view of the motions of that medium, which I conceive to be more intricate and wonderful than all other natural phenomena. It would be supposing that the whole process might be sketched on a plane surface like a sheet of paper. On the contrary, the axis-cylinder should be conceived of as an immense arena—as a miniature world, in which numberless undulations of various lengths, velocities, angles, directions, and powers, are in simultaneous movement. Such a complicated state is supposed to exist in the optic nerve, when the myriad objects from the outer world converge all their undulations into that narrow compass.

On this subject, Professor Draper remarks, "Nor is there any difficulty in admitting that through such a channel an infinity of vibrations may simultaneously pass, undisturbed by each other. All the varied objects around us, whatever may be their shape, or whatever their color, simultaneously transmit through the optic nerve, their proper impressions to be registered on the brain, There are similar phenomena in the case of sound;" and, he might have added, of all undulatory motions. Every cubic foot of matter or space is pervaded by the intermingling and still, not jarring, undulations of Light, Heat, Electricity, Magnetism, and,

possibly, other as yet unrecognized motions. So of the Nerve Force, the aggregate and complex of all Physical Forces in organic media. The abnormal nerve undulation, however marked and even terrific its effect in the peripheries, may constitute a very small portion of the molecular changes going on in the axis-cylinder. In some cases, however, the entire motions of the medium do appear to to be paralyzed.

This theory of cure will enable us to define clearly what we can expect Homœopathy to do, and what we know it can not do. The mechanical and chemical departments of medical science demand from the Homœopathic practitioner thorough cultivation. The purely medicinal treatment of injuries, which is always directed to the management of the reflex action of the nervous system, will, of course, be Homœopathic. The immense field of Hygiene, with its questions of sanitary reform and dietetical regimen, remains open for discussion and research. Wine, brandy, and other stimulants become in certain stages of disease, real substitutes, chemically or otherwise, for the Nerve Force, and, as such, achieve important indications which Homœopathic medicines can never fill.

There are measures of relieving disease, entirely independent of medicinal action, which demand the zealous study of the physician of any school, who would derive the most practical advantage from every species of discovery. The most important of these are, Electricity, Hydropathy, and that wonderful and still mysterious agent, Animal Magnetism. These are no longer novelties in the medical world, and a man's knowledge of their real condition is a pretty good test

of his openness of mind and habits of research, the two great and indispensable elements in the scientific character. To illustrate the efficacy of the first of these curative powers, I extract from an article on the "Therapeutical use of Electricity," in the British and Foreign Medico-Chirurgical Review, April, 1849, reviewing the reports of Golding Bird, Donovan, Pallas, and Becquerel on the subject.

"The first trial of the effects of insulation, was in the case of two patients suffering very severely from an aggravated form of dysentery. They were removed to their beds at noon, and, in three hours time, there was a marked amelioration of their symptoms. One of them, who had had four bloody evacuations, with violent colic, shortly before noon, did not pass another stool until eight o'clock, p. m., and he improved so rapidly from the time he was insulated, that, in five day's time he was in a state of convalescence. The other patient recovered from the period of his insulation, although not so rapidly. It is worthy of remark, that the pulse became considerably slower from the moment of insulation. Two other patients, one suffering from a very intense attack of sporadic cholera, and the other from quotidian intermittent fever, were cured in three days by the above means.

These cases are followed by twenty-three others, in which the symptoms and treatment preceding insulation are fully detailed, and in which great benefit certainly seems to have accrued from the mode of practice. They embrace cases of acute and chronic dysentery, choleriform diarrhea, intermittent fever, periodic epilepsy, acute articular rheumatism, visceral neuralgia,

bronchitis, and meningitis. From a careful examination of these cases, granting that they are faithfully detailed, which we have no reason to doubt, we cannot help acknowledging that insulation, in hot countries at all events, is a potent therapeutic agent in certain forms of disease. Its most marked and speedy effects are exhibited in cases of neuralgia. It always exerted a favorable influence on the number of evacuations, and on the heart's action. Cases of intermittent fever, quotidian, tertian, or irregular, if not complicated with bronchial irritation, yielded to the sole influence of insulation, without the necessity of having recourse to quinine or other medicine."

These facts, sanctioned by the highest authorities, give an instructive lesson to practitioners of both schools. They teach us that there is no need of, indeed, little rationality in, an exclusive reliance upon medicine of any kind. To the Homœopathist, they present an agent, attended with little or none of the ill effect he is inclined, sometimes too hastily, to attribute to Allopathic medication, which rivals, and in many cases may entirely and properly supersede his attenuations. And the Allopathist is reminded by them, that the most violent diseases of every grade and type are promptly and thoroughly cured, without medicine, by an imponderable agent, defined to be an undulatory motion of matter, transmitted through the human body, modifying the nervous system, and, through it, all the peripheral structures, displaying thereby a marked analogy to Homœopathic medication. Similar trains of thought will be suggested by a study of Hydropathy and Mesmerism or Magnetism, upon which, however, it is unnecessaay to enlarge in this connection.

If Homœopathy has indeed a firm and indestructible basis of a physical character, as I have claimed, it can make no compromise with Allopathy or any other system of medicine. It is either the science of sciences, or a tissue of the most preposterous absurdities. I, for one, am willing to put the question on no other grounds. *Aut Cæsar, aut nihil.* The really curative powers of Allopathy must be therefore always referable to mechanical, chemical, or strictly Homœopathic action. The two former have been often claimed as the latter by injudicious advocates of the new system. For instance, it has been frequently said, that the application of snow to a frozen limb is a Homœopathic measure. But it is so only in appearance, for friction with snow is indeed to a frozen limb a gradual application of heat. On the other hand the measure is far from being antipathic. Cold is not the opposite, but the mere negation of heat. In thus thawing out a congealed part, we merely add to the body a natural stimulus of which it has been deprived by a state of the atmosphere which has conducted away its own animal heat. The process is similar to that of giving food to a starving man. But the cases of Allopathic treatment really conducted upon Homœopathic principles might be accumulated into a large volume.

Dr. Symonds in an article upon Tetanus in the Cyclopœdia of Practical Medicine, assents to the general fact that the *similia similibus curantur* has occasionally been found curative in disease. "It is incumbent on us to look out for new remedies since the old ones have all failed. Upon this ground we are disposed to suggest a trial of strychnia: not that we have become followers of Hahnemann, but that it is a simple and

undeniable fact that disorders are occasionally removed by remedies which have the power of producing similar affections. It is quite unnecessary to explain this fact by an arbitrary principle, that an artificial irritation excludes a spontaneous irritation of the same kind. A more rational ground for an explanation of benefit received from Homœopathic medicines may be found in the consideration, that such agents prove by this occasional production of symptoms like those of the disease to be treated, that they act on the part which is the seat of that disease, and consequently that there is a probability that in their operation upon that part (whether it be in a sufficient degree to produce a similar disease or not,) they may effect a beneficial change. Oil of turpentine, for instance, having been known to produce a discharge of bloody urine, might be rationally administered in a case of spontaneous hæmaturia, not because it has a tendency to produce this disorder, but because that tendency shows it to have a specific action on the vessels from which the hemorrhage takes place."

What kind of idea of the universality and uniformity of natural laws must this gentleman have, when he confesses that cures may be accomplished by medicines which produce the very symptoms which it is the object of his Therapeutics to antagonize as much as possible? If a single case of cure on the principle "similia similibus" ever occurred, there must be a fixed natural and physical law underlying the phenomena, for which it is the duty of the man of science to search. With reference to strychnia there is a fact which confirms one point for which I have contended, viz: that a medicine may affect a diseased tissue with-

out having any perceptible effect on the healthy structures. It is known that in employing strychnia for paralysis, the action of the medicine is first of all exerted on the powerless limb, showing that its susceptibility is greater in disease than that of the other, and in an affection moreover, in which we would have expected its insusceptibility to be extreme.

Lepelletier in a fine monograph on tartarized antimony, says: "it produces dyspnea in dogs which were in perfect health before its administration; the lungs lose their color, are found hepatized and scarcely crepitate at all. One would imagine that, admitting its action in man to be similar, far from being useful, its administration would be particularly pernicious in the treatment of pneumonia, but it is not so, for we shall see that far from favoring engorgement of the lung it induces its resolution." Pereira in his article on prussic acid observes: "some time since I prescribed the acid for a lady who had suffered for months with gastrodynia, and who was persuaded from her sensations, she had some organic disease. The remedy acted in the most surprising manner: in a few hours to the astonishment of herself and friends, she was apparently quite well, and has since had no return of her complaint. It can hardly be imagined (naively continues the great Pharmacologist) that irritation of the stomach can be rapidly removed by a substance which is itself an irritant."

The worst forms of the paroxysms of congestive fever can scarcely be distinguished, even by the practiced eye, from the poisonous effects of opium. Opium is here pronounced by the highest Allopathic authorities

to be the most reliable remedy. Professor Bell advocates its use in the strongest manner: "What!" says he, "it will be exclaimed by some, give opium, a narcotic, in a state of apparent apoplexy, or stupor, which may be said to resemble narcotism? If the visceral congestion and the distended vessels of the brain were primary phenomena, and were not in the beginning, at any rate, the effects of a disordered nervous system, it would be rashness to give anything which might augment such a condition of organs; but as I have already more than once informed you, all these congestions and injections of tissue will entirely disappear with the removal of the paroxysm, which, as far as we can see, is accomplished through the intervention and by the direction of the nervous system." Again he observes: "In the algid form, the sensation of coldness with which the hand of another person is impressed, is not experienced by the patient himself, who may at the very time be complaining of inward heat. Calorification is imperfect here, from an analogous cause to that which interferes with the freedom of the heart's contraction and of the circulation, viz: the intensity of nervous irritation. A dose of opium, in either case, will sometimes remove or palliate the morbid state, which, if dependent on anervation or mere deficiency of nervous power, would call for stimulants of a high grade, in place of a sedative."

This is not only a case of Homœopathic cure, but an example, by no means rare, of a medical man of learning and ability, deducing the pathology of a disease from his preconceived view of the *modus operandi* of a drug. Nervous irritation is to my mind, a gigantic

phantasm, like Milton's Death, terrible on account of the very vastness and vagueness of its proportions. It is an immense cloak which may cover charitably any quantity of crude speculation and routine practice. With respect to opium, it evidently diminishes the generating power of the nerve-centers, the conducting power of nerve tubes, and thereby the active and sensitive phenomena of the organic periphery. From the primary condition, we may expect loss of sensibility and motion, suppression of natural secretions, coldness of surface, internal congestions, and indeed all the phenomena of a pernicious or congestive paroxysm. Its Homœopathic applicability is perfect. The idea that it has a specific power over irritation has been drawn from the common relief of pain by its use. This, I believe, is effected by its diminishing greatly or entirely the conducting power of the nerves transmitting the painful impression. Hence its value as a topical remedy. But such palliative measures must not be confounded with those which are positively and directly curative, according to fixed natural laws.

The examples already adduced are sufficient to illustrate my meaning, but counter-irritation is such a prominent constituent of Allopathic practice, and so clearly Homœopathic in its action, that I will give it a brief consideration. "The object of a revulsive," says Dr. Paris, "is to produce a salutary change in an inaccessible organ, by effecting an artificial change in one within our reach, and to transfer morbid action from a structure more immediately subservient to life to a less essential surface in sympathy with it. Using the term counter irritation in its most extended sense," says

Pereira, "we see our list of agents producing this effect is a most extensive one. It comprehends emetics, purgatives, diffusible stimulants, mercury, blisters, cauteries, issues, setons, moxa, blood-letting, (including arteriotomy, venesection, cupping and leeches,) irritating linaments, frictions, sinapisms, rubefacients, the hot and cold baths, and even mental impressions. That is, all these agents excite some action in the system which has a relation (often times beneficial) with the morbid action: to use Dr. Parry's words, these agents cure diseases by conversion." This action has been generally explained by the detraction of nervous and vascular power from the diseased surface to the skin or other irritated membrane. Pereira pronounces the hypothesis "perfectly gratuitous and incapable of proof." He discards all the attempted solutions of the problem, and says he is "content with the knowledge of the fact, that one disease, whether artificially or spontaneously generated, will often but not invariably supersede another."

It appears to me that a simple and satisfactory explanation of the whole matter is to be found in reflex nervous action. The nervous and vascular erethism excited externally is reflected upon all the internal parts, but more particularly upon those with which the irritated point has the greatest sympathy. This reflected undulation, like that excited by a Homœopathic medicine, obliterates the existing abnormal undulation by the given laws of interference. These undulations are faint and delicate, not sufficient to act morbidly on a healthy structure, but quite so for the cure of disease. Hence, a blister applied to a healthy man may not

cause an internal inflammation; but persistent irritation, such as teething and worms may do so, just as a long continued use of an attenuation will produce its pathogenetic effect.

When a degree of external inflammation is excited disproportioned to that going on internally, the internal morbid processes are sometimes much accelerated, or a true Homœopathic aggravation is produced. This we may suppose to occur when the wave lengths of the two undulations exactly coincide. Hence we are cautioned against premature blistering in acute diseases. Paris relates a case in which a blister early applied aggravated all the symptoms, and death resulted. In dissection, a portion of the lung exactly corresponding with the size and shape of the blister, was found in a more advanced stage of inflammation than the remaining pulmonary tissue. The nervous and vascular connections, which are by no means immediate or continuous, can not satisfactorily explain the phenomena. But the strongest evidence to my mind is drawn from a consideration of the different degrees of counter irritation in use. It will be seen that those agents are most successful, when the anatomical changes produced by the counter irritant correspond in a certain degree to those characteristic of the disease. For simple erethism of the internal organs, not amounting to persistent congestion, the prompt but transitory action of a rubefacient is amply sufficient. For positive inflammation attended with copious effusion of serum, as in pleuritis and peritonitis, the analogous operation of a blister is necessary. When the disease is of long duration, and marked by those anatomical changes of which ulcera-

tion is the type, as in chronic bronchitis, phthisis, and scrofulous swellings of the joints, pustulation with croton oil or tartar emetic is confessedly the most appropriate form of counter irritation.

Strong purgation in diseases of the brain does not alleviate by depletion or by detracting the cause of irritation from the brain, but by reflecting an irritation on the brain. The action is not ec-centric but ad-centric. This Homœopathic explanation of these remedial measures can only be overthrown by impeaching all the physiological testimony of the age, as to reflex phenomena. Homœopathists generally eschew this coarse and painful treatment, but it is only because they have discovered a method of attaining precisely the same end in a safe and imperceptible manner by internal medication.

Perhaps there is no fact in pathology more generally conceded, than the occurrence of internal derangements on the suppression of cutaneous eruptions, and ingenuity has almost exhausted her powers in attempting to explain the phenomena. In the reflex action, which I have just predicated of counter irritation, we may possibly find a thread to conduct us out of this labyrinth of uncertainties. By the immutable laws of the nervous system, a cutaneous disease, like every other irritation, must excite reflex action, and by the commissural connection of all the centers, a reflected undulation may be sent to all parts of the body—but as I have said, particularly to those in the strongest sympathetic relations. Thus counter irritation to the breasts may soonest relieve irritation of the uterus, next most probably that of the parts immediately beneath, next of

the brain, and lastly of more remote tissues. Now this reflected undulation may by constant interference with one already existing and constantly emanating from some nerve-center, ward off an internal disease. They obliterate each other like the small-pox and vaccine undulations. If by any means the vaccine undulation ceases, small-pox may be developed in the body. And so if a cutaneous disease is suddenly cured, chemically or otherwise, as with sulphate of copper washes, or by such baths or ointments as may excite curative undulations from the centers, the reflex actions which checks or antidotes an internal disorder is removed, and that disorder appears.

Two internal viscera may stand to each other in these antagonistic and prophylactic relations. Hemorrhoids and fistula have frequently prevented the development of pulmonary consumption, which has appeared on their removal. Some of the most curious phenomena of metastasis may be explained upon this ground. Certain modified undulations pass from an inflamed parotid to the base of the brain. The reflex action will be very likely to fall upon the sexual apparatus, from its known physiological relation with the base of the brain and cerebellum. To limit it still further, a glandular structure will most probably suffer, and accordingly we find the testes or ovaria become inflamed. The reflex action, excited by this new irritation similar to that of the parotid, cures the inflammation of the parotid on the Homœopathic principles already suggested. When the secondary affection is cured or disappears, the primary may again return.

I hope and believe that the application of the Laws

of Undulatory Interference to therapeutic phenomena, will be valuable in elucidating a philosophic rationale of Homœopathic cures. The principle, that one disease cures another, is like the old doctrine, that nature abhors a vacuum, unsatisfactory to the mind, and of no explanatory value. But the fact, that water rose thirty-two feet in a vacuum was incontrovertible; and nothing could have superseded the dogma, but the discovery of the true cause in atmospheric pressure by Torricelli. In a similar manner I trust the Laws of Undulatory Interference, applied to the Nerve Force, will put the Homœopathic principle, "similia similibus curantur," on a suitable scientific basis.

I have described Homœopathy as it appears in the narrow circle of my own vision. I am conscious, indeed, of having made a poor and inadequate exposition of a great subject. But the ambition which aspires to bend the bow Ulysses, is not without use, though it fail of its endeavor. I invite the medical profession, not to the caustic criticism of the views, but to the pursuit of the suggestions contained in this little book. The physiological episodes which I have woven into the text may prove entirely untenable. Every supposed fact I have adduced may be shown to be invalid, and every argument to be impotent, and still the fundamental principles, which I have aspired to advocate, may be essentially true and immutable. The correlation of Physical and Vital Forces, is now slowly looming up above the medical horizon, and will soon be recognized as a subject of vast significance. It is the rainbow of promise painted on the cloud. Its development will reveal the only vinculum which can asso-

ciate the phenomena of Physical and Medical Science. The few speculations in which I have indulged, can scarcely be said to have stated, much less to have exhausted the subject. The difficulties of the problem are vast, and the period of its solution may be indefinitely remote. Prejudice may abjure the task, indolence may shirk it, ignorance may despair of its accomplishment, but it must come at last. That the issue will be favorable to Homœopathy I can not doubt. And nothing is more devoutly to be wished by the sincere Homœopathist, than the addition to the professional corps of zealous and capable laborers, who while practicing the art, would cultivate the science of medicine.

APPENDIX.

Dr. Hooker's book was not received until the preceding pages had gone to press, or the thoughts suggested by its perusal would have been incorporated into the body of the work.

APPENDIX.

HOMŒOPATHY: An Examination of its Doctrines and Evidences. By WORTHINGTON HOOKER, M. D.

SUCH is the title of the Fiske Fund Prize Dissertation, of the Rhode Island Medical Society, for 1851. Although containing but 146 pages, duodecimo, it is, I believe, the most elaborate critique upon Homœopathy which has emanated from the Allopathic press upon this side of the Atlantic. Its appearance at this time, from a gentleman of some note in his profession, and under the auspices of a State Medical Society, is proof enough to the reflecting mind, that Homœopathy has outlived the prediction of the medical prophets. The attempt to despise and ridicule it down has proved inefficacious. The darkest frowns of Schools and Journals have not stunted its growth. A change of tactics has become necessary. The Universities of Scotland have set an example, which is likely to be followed by most of their cotemporaries, and which will certainly obtain a high place in the records of medical bigotry and folly. They have endeavored to take away their diplomas from such of their graduates as have chosen to study, believe and practice the new system. They have rejected one young gentleman, who passed a credit-

able examination, only because he would not give up his intention of investigating the subject, and have signified to all other candidates, with Homœopathic predilections, that they may expect a similar fate. What judgment a more enlightened age will pass upon such measures it is unnecessary to predict. In this country, however, they would be futile and even ridiculous. Here Homœopathy must be written down, and Dr. Hooker has made a systematic beginning. His book could not be called Historical Reminiscences of the Homœopathic Delusion, but is designed as the antidote to an active and living ferment, which is beginning to revolutionize both the art and the science of medicine.

The object of this production is well expressed by the author in his preface. "Homœopathy is so absurd, that it seems almost a waste of time and effort, to go through with a formal refutation of it. And so it would be, were its refutation not made necessary, from its adoption by so many of the intelligent and influential among the non-medical portion of the community. Such persons will find, I trust, on reading this essay, that their belief in the system of Hahnemann has been formed without a real understanding of its merits. And I flatter myself, those of them who will give me a candid hearing, will be induced to abandon such a combination of falsities and inconsistencies as this system presents." I see nothing objectionable in the fair and sincere endeavor of a conscientious man to prevent what he believes to be an imposition on the community. But I may remind Dr. Hooker, that he has here made, what would have been styled, had the subject been Allopathy, and the author a disciple of

Hahnemann, an unprofessional appeal to an incompetent tribunal.

Homœopathy has never yet received from its opponents, that impartial and comprehensive survey which it demands, and which it must ultimately obtain. The book which will convince the honest and intelligent Homœopathic physician of his errors in theory and practice has yet to be written. The author of such a book must forget temporarily that Hahnemann and his theories ever existed. He must bring to the analysis of the assumed facts and principles of Homœopathy the spirit of the chemist in his laboratory. He must not look upon it as a rival system of medicine, contending by fair means or foul for public patronage, but as a series of facts, claiming to be an integral portion of natural science, and demanding on account of their intrinsic importance to human life and happiness, candid consideration from all rational men, irrespective of schools or parties, of prejudices or opinions. He must not take for granted the accuracy of his own pathological and therapeutical views, and then pronounce every dissenting principle to be false, the mode of criticism most common among Allopathic writers. And, lastly, he must be certain that he brings against Homœopathy something more than theoretical objections. Until this labor has been accomplished in the right spirit, and in the right manner, and with results unfavorable to its pretensions, Homœopathy may enjoy the confident spirit of Napoleon, when he cried out to his soldiers, that the bullet which was to kill him had never been moulded.

Dr. Hooker's dissertation, however, is not addressed

to Homœopathic physicians. He probably thinks so many of them are knaves or fools, that a *scientific* exposition of the fallacies of Homœopathy would be entirely unheeded. His task has been a much easier one, viz., to infuse into the popular ear the crudities and misconceptions of his own mind. He is, without doubt, sincere in his convictions, and, perhaps, congratulates himself on having thus rendered an important service to his fellow creatures. His book will be hailed by his medical brethren as a valuable contribution to that hybrid literature, which oscillates between the professional corps and the great public. They will zealously recommend it to their patients, and through them to all inquiring gentlemen who stand in a rather disaffected relation to the Old Profession. In this manner, Dr. Hooker's book, enjoying "a little brief authority," will retard in certain circles the progress of truth. The Doctor will probably never be convinced of the mischief he has done. His volume may not be consigned to the shelf of medical errors and misapprehensions, to which it naturally belongs, until the author's tombstone is the only remaining record of his virtues and his achievements.

Three chapters out of the seven in this book are devoted to an estimate of Hahnemann, and an exposition of his system. I question few of the statements and acquiesce in most of the inferences. If Hahnemann ever sold a *secret* remedy, and I have never seen the charge refuted, then was he guilty, at that period of his life, of a most contemptible dereliction from the path of moral and professional duty. That he was enthusiastic and speculative is very true. His enthusiasm was

that intellectual fire which is the inheritance and prerogative of genius. His speculations were *jeu d'esprit* of his own, only to be accredited by others, so far as they can be corroborated by observation and experiment. To call upon a Homœopathist to believe and defend Hahnemann's *opinions*, is as unreasonable as it would be to suppose that we inhabit India, because Columbus was under the impression that he had discovered the eastern shores of that country. Hahnemann put mankind earnestly upon the pursuit of three great suggestions—the philosophical proving of medicines, the prescription of them according to the principle "*similia similibus curantur*," and the reduction of doses. These are the *practical* triumphs which will ensure him immortality, when his theories are forgotten with those of his opponents. These are the achievements which associate his name with those of the great benefactors of the human race.

Dr. Hooker calls Hahnemann's Organon, "a work which is universally regarded by Homœopathists as the great text-book of medicine." I claim to be a Homœopathist, and am even jealous of the honor; but I can assure Dr. Hooker, that I was so dissatisfied with the loose statements, the hasty inferences, and the dogmatism of Hahnemann's Organon, that I dropped it at about the 200th page, and have never finished its perusal. The naivete with which the Dr. seems to take it for granted, that the Homœopathic mind is or should be narrowed down to the Procrustean bed of the Organon, is a reflection to my eye of his own mental condition, and of the entire and unconscious subordination of his intellect to the yoke of authority. Hahne-

mann's psoric theory of chronic diseases has excited the almost indignant contempt of our author. Upon that ground I stand entirely uncommitted. I believe the accumulation of facts which bear upon the question is too limited, to give any man's opinion more than a very questionable value. The mental process by which Dr. Hooker has been conducted to his *very positive* conclusions, would be doubtless an inestimable example of medical logic. And although Dr. Hooker probably exceeds me in years, experience, and capacity, his mere dictum can not pass with my mind for the *proof* of a thing.

His strictures upon the Homœopathic "provings" are calculated to impress vividly, and thereby the more certainly to mislead the non-professional reader. The ridiculous trivialities, which he has fairly enough quoted from Homœopathic records, are the excrescences of our literature. They originated, however, in the desire to institute the most extensive, laborious, and pains-taking experiments. I consider the vast majority of them as totally useless to the physician, and believe that the bushel of chaff has been so long retained only from the fear of losing the grain of wheat, if it was all thrown away. These acknowledged absurdities seem to have deterred Dr. Hooker from even a respectable appreciation of the phenomena of "proving;" just as a scarecrow frightens the black birds from a field of corn. He appears to have jumped to the very illogical conclusion, that there can be no such thing as a medicinal "proving," because those reported in Jahr's Manual have not been made to his satisfaction.

I would refer the Dr. for an example of "proving"

to an article on Belladonna, in the North American Homœopathic Journal, for November, 1851. It is a mere selection from the N. Y. Journal of Medicine, and its author, Dr. H. M. Gray, would probably acquiesce in Dr. Hooker's views of Homœopathy. It is a report of two cases, one of poisoning with Belladonna in a child, and the other of experiments made on Dr. Gray's own person with the same drug. From these two sources, Toxicology and "proving," our Pathogenesis of drugs has been constructed. Now, instead of reading the "fifteen octavo volumes" on Belladonna, I advise Dr. Hooker to study this single article, and use a very small dose of Belladonna when he meets with similar pathological conditions in his practice. Every symptom given by Dr. Gray, is found in Jahr's Manual, asterisked and italicised. They are quite enough to guide the practitioner in the administration of the drug in the vast majority of cases. The diligent physician who would study Christison, Pereira, and the Periodical Medical literature relevant to both poisoning and "proving," and would then prescribe in minute doses according to the rule "*similia similibus*," might become a Homœopathist in principle and practice without ever opening a Homœopathic book. Dr. Gray concludes his essay by expressing the opinion, that it is quite as essential to experiment upon the healthy as upon the diseased body. And only when the Allopathic profession begins to act earnestly upon this suggestion, will it realize the fact, that it has been anticipated by Homœopathic laborers in the most important field of medical inquiry.

There is an immense class of symptoms in Jahr's

Manual, intermediate between those properties of a drug well recognized by Homœopathists, and the trivialities which will after awhile be expurgated. Therein lies the great value of the book. These treasures are invisible to Allopathic eyes, but will come forth to their view like letters made with sympathetic ink when held to the fire, as soon as "provings" are made in sufficient numbers, and by proper persons in the proper manner. A single illustration will suffice. Conium Maculatum is said in Jahr's Manual to produce "strangury," "sharp pressure in the bladder," and "cutting in the urethra while emitting the urine." I doubt whether Dr. Hooker is acquainted with the fact at all, and if so, I warrant he has never found it available in Therapeutics. Dr. Earle, another Allopathist, has reported some experiments on himself with Conium Maculatum, which may be found in the American Journal of Medical Sciences. Dr. Earle says: "on two occasions (after taking the largest dose in each experiment) there was a sensation of acute lancinating and transient pain in the region of the neck of the bladder." Hyosciamus, Opium, Stramonium, and some other modifiers of the cerebro-spinal axis produce no such effects. Aconite and Belladonna have analogous actions on those parts, but the operation of each of these substances is as easily diagnosed as measles, scarlet fever, and erysipelas. This is a brief and not very prominent example among thousands which might have been given.

Dr. Hooker, with a great show of fairness, parades before his reader the "very terrible totality" of Sulphur, as given in Jahr's Manual, edited, he says, by Constantine Hering, and printed in 1838. I have

never seen that edition, but if Dr. Hooker will look into Jahr's Manual, edited by Dr. Hull, 1851, he will get some information with regard to our views of Sulphur, which he sadly needed while playing the critic. His eyes will be immediately struck by the explanatory signs which cover the pages. Their significance he will obtain by turning to the beginning of the book. By the aid of these he will learn that Sulphur does not produce one-half the terrible symptoms recorded, but that these symptoms existed concurrently in diseases which were benefited by the use of Sulphur. This fact, which robs his criticism of its sting by displaying its total inaccuracy, he might have detected without the aid of explanatory signs, for the sentence "disorders from the misuse of cinchona and mercury," can not mean that Sulphur produced the symptoms expressly stated to have been produced by cinchona and mercury, but that it was of service in such cases. By a strict sifting of this kind, Dr. Hooker will find that the "very terrible totality" almost entirely disappears. Caries, scrofula, erysipelas, epilepsy, fevers, hectic, nervous, worm, tertian, and all, are explained away, and not one of them believed by Homœopathists ever to have been produced by Sulphur.

Nevertheless, Sulphur used in trituration and for some time can produce a very extended pathological condition, which covers Homœopathically certain stages of many natural and particularly chronic diseases. Dr. Hooker's pleasant reminiscence of his morning dose of Sulphur and molasses is designed to leave on his reader the impression that it had quite as little pathogenetic effect upon him and his schoolmates as

their bread and butter. But when, according to Christison, it has been found at the veterinary school at Lyons, that a pound of Sulphur killed horses by producing violent inflammation, recognizable during life by the symptoms, and after death by the morbid appearances, it can be readily conceived that there is something in Sulphur quite capable of producing a "very terrible totality." Before repeating the experience of his childhood in his second edition, I recommend a few doses of the 1st trituration of Sulphur daily for one or two weeks, as an experiment quite worthy of Dr. Hooker's attention both as a physician and a critic, and as likely to modify many of his very positive statements.

Dr. Hooker concludes his objections by the assertion that "there are two errors in Homœopathic provings which are fatal to their practical usefulness, viz: disregarding the difference between ordinary and infinitesimal doses, and assuming that all phenomena in the system come from the medicines under trial." The last assumption is a very absurd one indeed, and no Homœopathic physician makes it. But when I prevail upon non-medical friends, male or female, to test a medicine for me, I can not permit them to discriminate between subjective and objective, essential and accidental symptoms. They must record every thing, and from a number of such records, the *physician* must sift the real from the questionable. In order to invalidate the system of "proving" Dr. Hooker must show that *none* of the phenomena come from the medicine under trial.

Between these extremes lie the great facts of drug-

pathogenesis, and a field of truth which Dr. Hooker evinces little disposition to explore.

Dr. Hooker seems to think that "trivial occurrences" are stereotyped into Homœopathic literature and constitute a most important feature of our symptomatology. "Not a hint," he emphatically remarks, "has been made in regard to an expurgated edition of them." In opposition to this, I may recite the remark of Dr. Gray, a zealous and capable disciple of Hahnemann, that "the falsities and errors of our Pathogenesis are the canker-worm of Homœopathy." I might inform Dr. Hooker that the Homœopathic world for several years has been in commotion on the subject of revising and remodeling the Materia Medica, so as to weed out the superfluous, to re-test the useful, and make it every way more practically adapted to the physician's requirements. I would refer him particularly to the First Part of the Hahnemann Materia Medica, recently issued in London. It is a beautiful quarto of 137 double columned pages, containing three articles, Bichromate of Potash, Aconite, and Arsenic. The learning, accuracy, and acumen displayed in their preparation would do honor to Dr. Hooker or any of his compeers. Dr. Hooker seems totally unaware of the progressive condition of Homœopathy, upon which he so unhesitatingly presumes to sit in judgment.

The other objection strikes my mind as a very curious one, and it is certainly destitute of all weight. Upon what grounds does Dr. Hooker suppose, that there *is* any difference of effect between large and small doses, except a difference of degree? If a small dose is repeated frequently and long enough, will it not produce the effects of a large dose? The advantage in

using small doses is this: we are then much more likely to get the primitive action of the drug uncomplicated by sympathetic or reflex phenomena. I entirely agree with the Dr. in supposing that no *new* properties are developed by trituration or succession. He drops the subject of "proving" with the remark, that to be of any practical value "it must be conducted upon principles entirely different from those of the Homœopathic provings." What does he mean? We abstain from every thing which might prevent or complicate the medicinal impression; we take the pure drug at stated intervals: we record the supervening symptoms, and the practitioner culls out the *positive* effects from all the accidental or trivial accompaniments. What more can Dr. Hooker suggest?

Dr. Hooker's analysis of the principle, "*similia similibus curantur*," is made with much display of logical exactitude. The non-professional reader would scarcely suspect, that the whole argument is a brilliant example of the careless observation and loose reasoning, which the author so much deprecates in the introduction to his book. He seems to have a rather indistinct idea of the difference between a *recovery* and a *cure*; forgetting that recoveries may take place under two conditions—firstly, on the removal or cessation of the cause of the morbid state, and secondly, on the application of a remedy, which if it act at all must act according to some natural law. This last condition makes the recovery from disease a cure. Patients may be relieved of pneumonia by bloodletting, and of cholera by camphor, without any *law of cure* having been called into exercise. A full supply of arterial blood sent to the nerve-centers may aggravate and prolong a diseased

condition in the peripheries to which those centers correspond. A partial removal of it does greatly palliate, and permit a recovery to progress. It is like pouring some of the water out of a kettle to prevent its boiling over. Pouring a little more cold water in would have precisely the same effect. And Homœopathists have only abandoned blood-letting, because they have found means to secure all its uses without any of its disadvantages.

We have good reason from the combined evidence of physicians of both schools, for believing that camphor is decidedly beneficial in cholera. From our present knowledge of the article, we may safely pronounce it to be only partially Homœopathic. The necessity of employing it in large doses, is alone sufficient to show that it is not entirely so I would not have Dr. Hooker ignorant however, that a medicine may be more or less curative according to the extent of its homœopathicity. Over and above this, camphor can not *cure*, but it may promote a *recovery*, by the destruction of some irritative cause, for example, the sporules of fungi or animalculæ, to both of which sources cholera has been somewhat plausibly ascribed.

He denies our therapeutic guide to be a natural law, because it is not invariable, as Homœopathic failures prove. He here gratuitously supposes that Homœopathists possess the infallible means of putting the law always in operation. It is a law of optics, that the angle of reflection is equal to the angle of incidence. By means of this law we may throw with a mirror an image of the sun on a darkened wall, and even on a certain spot upon that wall. But if we do not hold the

mirror in the proper position, we can not make the optical law available to our purpose. If we do not or can not choose the drug which bears a definitely similar relation to the disease, no cure will result. The deficiency lies, not in the absurdity of the principle, but in our limited acquaintance with drugs. "*Similia similibus curantur*" might be an invariable law of nature, although no living being had ever put it into operation. The weight of evidence is entirely in its favor, and we have as yet made probably only an approximation to its real and effective use. Whether or not this is the *sole* law of Therapeutics, it would be rash to affirm, with our present knowledge and powers of analysis. One thing is certain, that Allopathic Therapeutics offers us no guide but empirical formulæ, nothing which can for a moment pretend to the dignity and certainty of natural law, and therefore to be used as a point of comparison with Homœopathic principles.

Dr. Hooker makes one affirmation, which, he says, is so obvious that he need not dwell upon it. To me it is so obscure, that I dwell upon it in vain, to elicit any meaning. "If *similia similibus curantur* be the *sole* law of cure, then a remedy should never produce in the sick, effects similar to those which it produces in the healthy." This appears to me to depend upon what relation the remedy bears to the particular disease, and also upon the dose of the medicine. If a man has pneumonia, I see no reason why jalap should not purge him, if his bowels are healthy. If he he has a diarrhea resembling that produced by jalap, jalap in a minute dose will not purge but cure him. In the full dose it

might at first greatly aggravate the disease. "Opium," he says, "ought never to produce somnolency in those who are wakeful from disease." Why not, if the dose be sufficient? Again he says, "it should never increase a somnolency already existing." This depends upon the nature of it. In the common somnolency of apoplexy and of a certain stage of typhoid fever it is invaluable in our doses: in that produced by depressed bone, it could do but little good till the bone was elevated: in that occasioned by a poisonous dose of opium itself, it might be decidedly injurious because isopathic. These points alone might satisfy a critic of the very contracted view Dr. Hooker seems to have taken of the subject.

His survey of "Homœopathic Illustrations" is very keen and in my opinion very just. He shows the looseness of the reasoning by which the treatment of burns and frost-bitten limbs is considered to be Homœopathic. He gives "Othello's reproof of Cassio" a very proper estimate. The curious fancies, that the light of the stars is removed by that of the sun, and the terrible sound of cannon obliterated by the roll of drums, although probably examples of undulatory interference, are but poorly illustrative of Homœopathic principles. The assumption that moral diseases are cured on the same principle, in the present state of Psychology, is equally without foundation. At these and many more such "illustrations" I have often smiled as good-humoredly as Dr. Hooker. On no such "illustrations" is my faith in the principle, "*similia similibus curantur*," founded. I congratulate Dr. Hooker on the ease and grace with which he has demolished these men of

straw. He has rendered good service to the benighted laity. Flushed with victory, he is probably willing to hazard something in behalf of the *profession*. I invite him to study diligently the undulatory theories propounded in this little book, and to analyze the "Homœopathic illustrations" therein presented. I promise to take his severest castigations in good part, if he will give me a *bona fide* ray of intellectual light, and I will be equally thankful for it, whether it illuminates his darkness or mine.

That Dr. Hooker is but little imbued with the strictly philosophical spirit, is evident from his old-fashioned and complacent use of that very vague and misleading term, "curative tendency of nature." His is not a merely provisional use of it, to be extenuated on the plea of the paucity of our language for scientific precision. He positively believes there is something occult in the body which *cures* diseases. He would find himself troubled to give an unexceptional definition of this curative power. Is it a thing, or is it a Force? If a thing, it is molecular—if a Force it is matter in motion. What relation does it bear to the Nerve Force? He must answer such questions as these, if he would give his "curative tendency of nature" a positive basis, and make it worthy to be entertained even as a speculation. In analyzing the human body, we have no right to look upon it as any thing but a machine, made up of material molecules, permeated by undulatory motions, and governed from its conception in the maternal womb to its dissolution in the grave, by natural laws. When diseased, it recovers either by its common action after the cessation of the cause, or by the agency of some

natural law. By its property of reflex action, it is a self-adjusting apparatus in a very great degree. By the undulatory theories of the Nerve Force and of medicinal action, I have endeavored to illustrate how diseases may be cured by physical laws. To hypothecate the existence of any other, in the present state of our knowledge, is illogical and unscientific, and indicates a blind adherence to dogmas, for which I have neither sympathy nor respect.

Dr. Hooker appears to be a religious man; or at least to entertain a profound reverence for the doctrines of the Bible. I conjoin with him cordially in his admiration of the sublime verities of the Christian religion. On this ground I might urge him as a man, solicitous to stay the march of *scientific* infidelity, to look candidly and steadfastly at the physiological views I have suggested. It is this vague attribution of organic forces, vital forces, curative forces, etc., to *matter* which has emboldened the sceptic to affirm, that our noblest thoughts and our purest emotions are *secreted* by nervous matter from the blood. When the Forces of the living body are believed to be modifications of external agencies—when the Nerve Force is recognized as an undulatory motion of molecular matter, of which thoughts and affections can no more be predicated, than they can be of Heat and Light—how will the infidel account for psychical phenomena? He will be driven to give them an individuality entirely distinct from that of matter, and to look upon the body as the temporary medium of the mind.

Dr. Hooker is always minute and sometimes facetious on the subject of infinitesimal doses. The gusto

with which dwells upon the "*downward* shakes," recommended by Hahnemann, shows him to be of that vast class of minds, who are captivated and riveted by some insignificant item, almost to the forgetfulness of the essentials. He considers the adjustment of the dose to be of permanent importance to the interests of Homœopathy, and is amused at the facility with which we skip from millionths to billionths of a grain. The Doctor will probably be quite puzzled at an idea which I have advanced in one of the preceding Essays, viz: that after the first or second attenuation, the *quantity* of medicine becomes comparatively unimportant, and the curative action depends upon the *form* it has assumed by further subdivision. There may be a vast difference between the real curative action of the 30th and that of the 200th dilution, and no perceptible difference between a drop and a cup full of either. If the Doctor complains of this idea as an abstraction, I can point out to him a simple method of getting rid at once of all his theoretical objections to infinitesimals.

The gentleman who returns to his office after having left ten grains of calomel with this patient, twenty of ipecac. with that, an ounce or two of castor oil with a third, and sits down to make an *arithmetical* calculation of the quantity of medicine contained in the 30th dilution, will see the subject in a most ridiculous light. Comparing the not at all severe operation of his crude drugs with the probable action of these incomprehensible fractions, he is astonished that men of sane minds should ever use the latter. Now let the same gentleman, Dr. Hooker for instance, suppose that a physician, resolving to test Homœopathy thoroughly, prescribes

small doses, say the 1st trituration, on the principle, "*similia similibus curantur.*" Suppose he is speedily struck with the number, promptness, and thoroughness of his cures, and fully convinced of the truth of the therapeutic law. Suppose, moreover, that he frequently notices a marked aggravation preceding the amendment, and the idea strikes him, that by diminishing the dose he may probably get the amendment without the aggravation. Suppose he finds a 3d trituration to do this. Suppose he continues diluting, and the medicine continues to cure. Suppose that although he may be immeasurably astonished at the facts, he has as little reason and indeed less to doubt the number, promptness, and thoroughness of his cures, than he had when using the 1st trituration. Now, this chain of suppositions is the chain of real occurrences which have led Homœopathic practitioners to the use of infinitesimals. Against a mind thus fortified, Allopathic arguments and ridicule are alike impotent, The rationale of facts so broadly based on observation and experiment, may be safely left to future discovery.

Dr. Hooker gives us a chapter on the "Practical Evidences of Homœopathy." There if anywhere, one would suppose, his genius argumentative and critical, would have scope enough. But whilst there is an amplitude of philosophical generalities and many suppositions, there is a remarkable meagreness of facts. He dilates upon the sources of fallacy and the uncertainties of inference, as if he had caught the very spirit of Mills, Whately, and other great logicians. If this lofty spirit of cautious criticism would busy itself a while in the chaos of Allopathic therapeutics, it

would come out with a little more charity for our "inconsistencies." But I doubt whether even credulous laymen will be imposed upon by Dr. Hooker's *negative* arguments. The assertion that converts to Homœopathy from the Allopathic school were bad Allopathists from the beginning, is rather an inference of the Dr.'s prejudices than a fact which he can substantiate. The doubtful value of medical statistics has an equal bearing upon every system. Whilst I acknowledge that many Homœopathic reports may have been as false as newspaper puffs, I contend that there are many not to be so easily adjudicated, and which are quite sufficient to decide whether large or small dosing is the imposition upon mankind. The *guess*, for it can be no more, that most of the cases are trivial in the vast practice of physicians, who are now numbered not by dozens and scores, but by hundreds and thousands, is too gratuitous to be further noticed.

Dr. Hooker set out with lofty and praisworthy intentions. Not only did he design to rid the public of this hideous night-mare imported from Germany, by a touch of his pen, but the chief object of his work was to develop "the true application of the rules of evidence to medical practice generally." I have sought in vain through his desultory pages for the promised morsel of logic. Loose and vague remarks about the frequent invalidity of evidence, the proneness to hasty generalization, the sources of error, human credulity, etc., etc., were the only rewards of my diligent perusal. The layman will probably conclude that Dr. Hooker is a very cautious, laborious, acute, and sagacious gentleman. The physician, who can look deeper than the

phenomenal surface, whilst he meets with nothing or at least very little of which to disapprove, is conscious that Dr. Hooker's chapter on the "practical evidences of Homœopathy" is a total failure to hit the mark at which he was aiming. I wonder if it never occurred to Dr. Hooker's practical mind, that the careful and minute report of some half dozen cases of acute disease, treated on Homœopathic principles, and without making any impression on the morbid condition, would have had more weight with his readers than a whole volume of such chapters "on the practical evidences of Homœopathy."

After mis-stating the grounds upon which our indications are based, Dr. Hooker continues: "Very different from this are the views of Allopathic physicians. They find out, so far as they can, the *causes* of the symptoms, the *seat* and the nature of the disease, and for this purpose, look at all the evidence which the present condition and the past history of the case furnish. We will take a very familiar example. If a patient have pain in the head, the rational physician considers it important to discover whether the symptom is produced by a disordered stomach, a determination of blood to the head, or some other cause, and applies his remedies accordingly. But the Homœopathist regards all such inquiries as '*useless questions*,' and aims his remedies only at a group of symptoms, of which the pain in the head is one." Now, I call upon Dr. Hooker as a gentleman of candor and honesty, to examine the article Cephalagia — (a mere synopsis, by the by,) in Jahr's New Manual, vol. 2, pages 241—49, and to learn what a miserable tissue of misrepresenta-

tions (to use no harsher word) he has put forth under the sanction of his name.

Dr. Hooker adduces, as a very strong argument against Homœopathy, the fact that Homœopathic physicians have been known to use large doses on the old principles, and he insinuates that it is of very general occurrence. Now, I confess, freely, that I prescribe Allopathically whenever I am at a serious loss for a suitable Homœopathic remedy, and consider myself amenable therefor to no tribunal of physicians or laymen. But I can assert that my resorts to Allopathy are very infrequent, and made much oftener in trivial than in severe cases. My conscience would wound me to the quick if I treated pneumonia, pleurisy, dysentery, erysipelas, croup, or cholera, with any but Homœopathic remedies. Upon the subject of occasionally conjoining the systems, I will be a little more explicit, because I find the following dogmatic paragraph in a near neighbor, the Western Lancet, for February, 1846: "Now, here are principles totally at variance with those received by regular physicians; and it necessarily follows, that if Homœopathy is applicable to *one* case, it is applicable to *all*, and if it is inapplicable to one disease, *as a system*, it is adverse to all. We have no hesitation in saying, therefore, that he who pretends to practice both systems — that is, what is known as Allopathy and Homœopathy — alleging that either may be used at times, is guilty of a willful and premeditated dishonesty."

The Lancet bases its idea upon the groundless presumption that Homœopathy is, or pretends to be, *perfect*. It seems to forget that a principle may be true,

and that still we may be able only to avail ourselves partially of its utility. Homœopathy may be applicable to many cases, and yet not applicable to all. Why? Because our knowledge of drug-pathogenesis is very imperfect. I may prescribe Homœopathically for nine cases with entire success, and find in the tenth a group of symptoms which I can not cover with any drug in my possession. What shall I do, confess my own ignorance, or impeach the value and truth of Homœopathy? Modesty would certainly recommend the former course; the latter would be a hasty and illogical inference, begotten by bigotry and prejudice rather than by reason. The Allopathist, on the same ground, must renounce his whole system because he can not cure cancer, consumption, or hydrophobia. Why, under these circumstances, do I use Allopathy? Many Homœopathic physicians use nothing, because they consider Allopathy worse than nothing. I use Allopathy, because, although sheer empiricism, I am convinced it is much better than nothing, when it is judiciously employed.

The Lancet professes to cultivate that philosophical and comprehensive spirit, which fixes on truth and abandons error with equal facility, when either are discovered. And yet, with a narrow exclusivism, which I can scarcely comprehend as emanating from a rational mind, it says to the inquirer who believes he has discovered a new principle, which he puts into valuable, although imperfect operation, "Stand by your principle in toto or abandon it entirely." And when it threatens any deviation from the path which it has pleased to prescribe, with the charge of moral delin-

quency! I am forcibly and humorously reminded of that old theological prejudice, which looked upon astronomical speculation as the foulest heresy, and condemned Gallileo to the dungeons for disseminating "principles totally at variance with those received by the regular" clergy.

I can conceive of a case, however, to which the remarks of the Lancet are fully applicable. When a man denounces Allopathy to the public as a dangerous, insidious, and fearful imposition on their misfortunes and their credulity, and when he asserts Homœopathy to be a perfect and infallible system of medicine, and speaks and acts as if he especially was commissioned by the gods to dispense their richest blessing to suffering humanity, and when he nevertheless secretly resorts to Allopathic measures to appropriate their usefulness to the benefit of his Homœopathic reputation, no hand should ever be raised to shield him from the contempt of all honorable men. But there are physicians too modest and cautious to denounce or to advocate anything unreservedly. They have the sagacity to detect the deficiencies of all systems, and the moral courage to acknowledge their own. They are animated by a pure love of natural and medical science. Unboasting, they scorn to pander to popular prejudices, and unflinching, they disregard the shafts of inconsiderate enemies. Such men can use remedially from the purest motives, and on the strongest grounds, Homœopathy, Allopathy, Hydropathy, Eclecticism, Kinesipathy, Mesmerism, or anything else, only however as their own judgment dictates, and not at the option of their patients. If the Lancet can make no discrimina-

tion between these two classes of individuals, I commiserate the morbid condition of its head and its heart.

Dr. Hooker, in common with most Allopathic writers, puts a very low estimate on the average mental caliber of the Homœopathic profession. Many quacks, by whom I mean persons of great pretensions and great ignorance, profess to believe and practice Homœopathy. In new ground, which the hand of man would reclaim from the luxuriant waste of nature, the weeds grow faster than the grain. But the true Homœopathic profession, although numerically far inferior, will compare favorably with its opponents, whose modesty, in their collective capacity, is certainly not the foremost of their virtues. Dr. Hooker assumes that all the educated and respectable gentlemen who have embraced Homœopathy, were such dreamers and enthusiasts, that no possible mental transmogrification need be wondered at in their cases. History, in any of its departments, might have taught Dr. Hooker, that the man who is misunderstood is always a dreamer to the man who misunderstands him. But Dr. Hooker in my opinion gives the finishing stroke to his misapprehensions when he affirms in italics, that Homœopathic physicians as a body wholly neglect the study of Anatomy, Physiology, and Pathology, a libel, unworthy of himself and his school, and to which I can not condescend to reply.

The least of all arguments in my eyes, in Dr. Hooker's is the greatest. The medical profession has "perseveringly and almost universally" rejected Homœopathy for fifty years. He would have us believe that the medical profession is our Areopagus, which

dispenses immaculate justice to every petitioner. His strongest reason is, that it is "composed of men who have every variety of opinions and are not bound together by any particular set of doctrines." But he forgets that these men are bound together, and that too by an iron fetter, in comparison with which a creed is but a silken thread. It was Mr. Jefferson, I think, who said that public opinion was an *auto de fè* more terrible than that of the Inquisition. The medical profession is bound together by an *esprit de corps*, which, however valuable for efficient organization and the perfection of the Home Department, is the arch enemy of every thing like liberal research. A man can scarcely realize how much the principle of association can effect, until he looks back into the pages of political, religious, and medical history, and sees how much the principle of association has resisted.

True to his fundamental aim of recalling to the support of the old profession, the failing patronage of the more intelligent classes, Dr. Hooker makes some *ad hominem* appeals to clergymen and lawyers. He invites the former to suppose "that fifty years ago some theologian had broached a new mode of biblical interpretation," proposing "to set aside all old rules and modes." He then runs what he considers a perfect parallel between this revised theology and Homœopathy, and asks triumphantly, if there could be any truth in what the majority of the clerical profession rejected. Now I am confident that I express the sentiment of the mass of educated men, when I say that some such "new mode of biblical interpretation" would be a God-send to discordant Christendom: and all ecclesiastical

history warrants us in the supposition, that such a mode, although it bore the commission of heaven, would lie for fifty or even a hundred years under clouds of obloquy and misrepresentation.

Again, he supposes some political fanatic to come forward with a new interpretation of the constitution, which is rejected by statesmen and jurists as a body throughout the country. He presumes that educated lawyers all over the union would of course despise it. My imagination fails to detect the appropriateness of the parallel. The constitution is a written document; medical science is a vast sphere of natural facts, in which we are all groping in comparative darkness. When the gigantic intellects of Clay and Calhoun clash fiercely over the meaning of a carefully worded state-paper, it may be readily conceived that two medical cliques may differ widely about the mysteries of vitality and therapeutics, without our being driven to the conclusion, that one possesses all the wisdom and the other all the folly. If Dr. Hooker made efficient his dogma, that the approval of those who are considered most competent to judge is the only test of truth, he would put a lock-chain on the wheels of progress. There is little doubt, that all the fashion and learning of the Austrian and Russian courts, concur in denouncing Kossuth and his democratic minority of adherents, as vile radicals, utterly and despicably ignorant of the laws of nations, the principles of government, and even of common sense. There is no necessary relationship between the opinions of men and the facts of nature. A thing may be true and receive no credence, it may be utterly false, and yet never be disputed.

Far am I, however, from attributing this rejection of Homœopathy to "willful and wicked obstinacy." I am much more charitable, but must impute it to those clogs upon the chariot wheels of truth, ignorance and indolence. The number of men who think for themselves upon any subject is amazingly small. There are demagogues in science and religion, as well as in politics, who deny this. Those most fettered deny it most stoutly, for unconscious slavery has all the charm of perfect freedom. The severest mental struggle is that which frees us from the opinions and impressions which others have imposed upon our minds. I am constrained to believe, that the medical profession as a body, like all other associations of men, groans under the incubus of authority. If the London Lancet and the American Journal of Medical Sciences were to become thoroughly Homœopathic, the defection from the old ranks in one year would be almost incredible, although the real amount of evidence in that short time could not have been materially augmented. Or, to give a more pertinent illustration, Dr. Hooker's book, in the caricatures of which I can scarcely recognize the system I profess to believe and practice, will fall into the hands of many of the young men who will receive their diplomas at the close of the present sessions. It will fix in their minds an utterly erroneous opinion of Homœopathy, and its pretensions, and by diffusing so many centers of darkness, will contribute to perpetuate and thicken the cloud which has so long obscured the medical horizon.

The most hopeless form of ignorance is that which masquerades in the disguise of knowledge. We begin

to be wise when we know that we are foolish. He will be most lenient to theories and practice at variance with his own, who is most fully aware of the rudimental condition of all our Physiology, Pathology, and Therapeutics. He who is most confident of his acquaintance with the causes of disease, the mysteries of function, and the operation of drugs, will be dogmatic in spirit and insulting in manner. Beyond the mere facts of organization, as detailed in Anatomy, Chemistry and Botany, and the purely mechanical principles of Obstetrics and Surgery, there is very little that can be called POSITIVE in medical science: very little of more than provisional use and hypothetical value. Until the physiology of the Nerve Force emerges from its Cimmerian darkness, all judgment against Homœopathy is premature, and even if confirmed by future discoveries, will substantiate the rashness rather than the reason of the critics. I look with confident hope however, to the progress of physiological research for the proper confirmation of the principles of Homœopathy.

Dr. Hooker concludes his book with an appeal to the "intelligent and influential" in the community to sustain the medical profession against the assaults of quackery. Quackery, in Dr. Hooker's opinion, does not appear to mean, that pompous pretension of ignorance to knowledge, that secresy of measure, that mercenary character of mind, which are commonly signified by the word. With him, and indeed, with all men of his stamp, decided difference of opinion is quackery. Although a physician be possessed of all the learning of the age, and adorned with all the

virtues and graces of the gentleman and the Christian, if he believe in the principle "*similia similibus*," and use small doses, his "mental obliquity" is extreme; and if his moral and intellectual worth inspire the community with confidence, and secure him an extensive patronage, his quackery is so damnable, that Dr. Hooker's professional dignity is insulted by the least association with a wretch who has departed so far from the established standard of faith. This departure Dr. Hooker stigmatizes with the name of *radicalism*, and expects the advocates of conservatism, of which he is a very antiquated type, to rally to the defense of their domicils. It is probably too late in his life for Dr. Hooker to catch a portion of the spirit of the age, but I can recommend to his declining years a little less faith in the infallibility of his own opinions, and a little more charity for those of others.

I have not exposed all the errors and fallacies of Dr. Hooker's book, for their name is Legion, but quite enough to show that it is unreliable as a source of authentic information concerning the true scope and nature of Homœopathy, theoretical or practical. Every page betrays the composition, not of the seeker for truth, but of the critic, who, satisfied with the extent of his own knowledge and the correctness of his own opinions, has tested the new system from his old standpoints, and pronounced it false. Dr. Hooker's views of Homœopathy are neither comprehensive nor original, being just such as one may gather at any time from the conversation of a respectable mediocre practitioner of medicine. He has not even risen superior to the littleness of partisan spirit. From his critical

and controversial talents his own cause has but little to hope, and Homœopathy has nothing to fear. Instead of reading in order to cavil, I advise him to experiment in order to learn. I am confident that his sphere of usefulness lies rather at the bed-side than at the writing-desk. I shall be happy if some suggestion of my own induces him to give the subject a fuller and more practical consideration. If his mind should be enlightened and his medication amended, I will have delivered a respectable gentleman from the bondage of error, and bestowed a still greater blessing on the good town of Norwick.

EXTRACTS.

[I MAKE the following extracts from standard Homœopathic authorities, for Dr. Hooker's especial benefit—and if, after their perusal, he persists in the belief of the old misrepresentations—that Homœopathists have no need of Pathology—that they make no inquiry into the causes and general history of the case—that they profess to have a perfect science which already supersedes every thing else, etc.—then I must give him over to incurable darkness of mind and impenetrability of conscience.]

I. *From the North American Homœopathic Journal*, August, 1851, Article—MARCY ON PATHOLOGY, *considered in its relations to Homœopathy*. Pages 325 and 331.

"We fully appreciate the value, and absolute necessity even, of noting all the manifest symptoms of disease, and of our selecting our remedies in as complete accordance with these symptoms as possible; but since many serious disorders are constantly occurring, which are either unaccompanied by any visible symptoms, or by those only which are vague and non-characteristic,

thus rendering a proper selection of remedies extremely difficult, and sometimes impossible, we should not hesitate to call to our aid a means of knowledge so important as pathology. Cases not unfrequently arise, also, in which all the apparent symptoms of a disease may be perfectly covered by several different medicines: in cases of this description, it is manifestly most proper to select that particular drug which produces pathological changes when taken in large doses, most closely resembling those of the disease we wish to cure. By this method, our simile will be more complete, and our success more certain."

"So far, then, as the selection of a remedy is concerned, we deem a single characteristic symptom—one which we know arises from a drug-action similar, both locally and pathologically, to the morbific action—of more importance than a number of merely sympathetic symptoms. In the one case, the application of the remedy becomes reduced to the certainty of a demonstration; while, in the other instance, we can not always reasonably entertain the same perfect assurance of success. Groups of sympathetic symptoms, apparently precisely similar, may arise from derangements of different tissues, from dissimilar causes, and from morbid actions entirely unlike; while the pathological symptoms, (if we may be allowed the expression,) can only proceed from disorders of particular parts of the economy, thus constituting groups *sui generis*. This important classification has already been attained with a number of our medicines; and when the pathological effects of all our drugs, and the symptomatic phenomena arising from these changes, shall have become

thoroughly understood, in connection with the pathology of diseases, the practice of our art will become reduced to almost mathematical precision.

II. *From the British Journal of Homœopathy—Oct* 1851. Article—HOMŒOPATHY, *as applied to the Diseases of Females—a Review.* Page 661.

"WHEN the exact morbid action is unrecognizable, *i. e.* when general symptoms alone manifest themselves, or when an affection is produced which is not to be found in our pathogenetic records, the practitioner would then be warranted in selecting a remedy known to increase the susceptibility to suffer from the same exciting cause, which his examination has proved to be operative in the case under consideration. But as long as this is not the case, it is his duty not only to find a remedy which exalts the susceptibility, but which also acts specifically upon the organ which in his patient has proved the suffering one. Without such correspondence the treatment, however satisfactory it may chance to prove, partakes of that indefiniteness which has ever been the bane of Allopathic practice. We have repeatedly noticed in conversation with our brethren that the fault above alluded to exists most markedly in those who pride themselves upon being pure Hahnemannians, who have a perfect horror of what they call "treating names," and who loudly proclaim the necessity of individualizing every case, and treating it in exact accordance with its symptomatology; and yet if

you carefully examine their practice you will find that this exact correspondence is often reduced to a coincidence of causation as above stated, or to the resemblance of some very out-of-the-way symptom which may in reality have little, if any essential connection with the morbid process. Thus, for example, Bœninghausen, in the preface to his *Pocket Book*, relates approvingly a case where *carbo animalis* was selected in consequence of the patient becoming worse after shaving, which symptom has found a place in its recorded pathogenesy, whereas we should feel more disposed to call this a lucky hit, while we should feel bound to condemn the practice, however successful, as most unsatisfactory in its tendency. If such a method of selection be once fully admitted, our practice would become so intensely mechanical as almost to merit the censure passed upon it in Dr. Forbes's celebrated article on "Young Physic." For our own part we feel that the only real progress of Homœopathy will be in the direction of pathology. The two sciences of pathology and pathogenesy are obviously calculated to mutually elucidate each other, and to advance *pari passu*, and we confidently expect that a time will come when servile symptom-hunting will be no longer urged upon us by any of our colleagues, and when moreover our Materia Medica will be purged of the overwhelming mass of symptoms whose real significancy is, as yet, so little understood."

III. *From Jahr's New Manual, Vol. 2nd:* INTRODUCTION. Pages 19 and 20.

"THE difficulty does not always consist in finding what we seek—the essential point is to find what we ought to seek; and this has always proved a stumbling block to beginners. Nothing, in fact, can be more difficult than establishing a perfect correspondence between the symptoms of the patient and those of the medicament. It is generally said that the *characteristic* symptoms ought to accord; but what are the characteristic symptoms? What are the essential points to which we should direct our attention? Is it the *cause* which produces the malady? Are they the *pathognomonic symptoms?* The *organ wounded?* Or, indeed, the *conditions* under which the symptoms manifest themselves, or the *general symptoms* which accompany the *local symptoms?* Is it the *kind* of pain, or its *seat?* In our opinion, no one of these points alone is essential; but the whole together, and each one according to its value. The *cause*, in conjunction with the *local* and *pathognomonic symptoms*, indicates the kind or family of medicaments we ought to consult; the *conditions* and *concomitant* and *general symptoms* distinguish that which is specific to any given case. In the mean time, it will not be less true to say that the *general* and *accessory symptoms* with the *conditions* indicate the kind of medicaments to be consulted, among which the *cause* and *local* and *pathognomonic symptoms* consequently distinguish the specific for a given case. But to which ever side we go, we shall equally reach the same conclusion, provided, in the research for

the medicament, we consider every point in an impartial manner."

"The *proportionate* resemblance of the symptoms, forms another point which should command our attention in the choice of a medicament. We have before said that the *cause*, *organic lesion* and *pathognomonic* symptoms indicate the kind or family of medicaments to be consulted, while the *accidental* and *individual symptoms* enable us to find that which, in a given case, is the true specific. But that this may become as true in practice as in theory; it is yet required that the individual symptoms of the medicament correspond precisely to the individual symptoms of the malady. For the sake of illustration, take an example of *phlegmonous angina*, with a tendency of the tonsils to suppurate, and characterized, as to a salient symptom, by *burning pains of excoriation*. *Belladonna*, *Mercury* and *Cantharides* may be indicated in such a case, since they relate to the pathognomonic symptoms, such as swelling, inflammatory redness of the parts affected, difficult, painful, or even impossible deglutition, etc. *Belladonna* and *Mercury* may also cover the symptoms of *burning* (or smarting) *pain* of *excoriation;* but the only medicament applicable to this case is the *Cantharides*, since neither the *Mercury* nor *Belladonna* have this symptom in a manner as decided as we suppose it to be in our example, while the *Cantharides* produce not only in the throat, but also in all the internal organs, *burning pains* of excoriation as one of its most distinctive symptoms. On the contrary, in another angina of the same pathological nature, where, in addition to burning or smarting pains of excoriation,

the most prominent symptom is an *excessive salivation*, we should be in great error to suppose *Cantharides* still indicated, because it also answers to salivation; for here the *Mercury* commands the preference, inasmuch as the *salivation* is a more decided peculiarity of it than of the *Cantharides*, and also because the salivation is in this case the predominant symptom."

IV.

The following extracts from *Wilkinson on the Human Body* are characterized by a quaintness and piquancy of style really delightful. Homœopathy may be very appropriately substituted for Mesmerism in the last selection.

"THE homœopathic law also accounts for the cures that have taken place under the other practice, and shows that they are owing to a latency of homœopathy in the common sense of its predecessor.

We are indeed convinced that the law of treating like with like, is the one intellectual formula to which the healing art has attained. Nevertheless, we do not assert that at a given time any art is prepared to stake itself completely upon practice dictated by science. The genius of man walks willingly with positive knowledge, but there come times and cases, when he falls back upon the unknown chaos, and trusts for instinctive revelations there. We would not therefore cut connection with allopathy; because there will be a certain number of instances where there is no knowledge, and where chaos is a resource. When these arise, it is a comfort that they can be committed to that

respectable body, the old medical profession, which to do it justice, has its own stars in its own night. We think however that it is a mistake to call its art, *allopathy;* it should be termed *chaopathy*, because it is without a formula, and welters down time by that set of falls which are vulgarly known as good and bad luck.

Homœopathy requires many changes, and new brains of the Hahnemannian order, before it will do itself justice according to the conception of its founder. I know no set of problems which would better repay severe thought founded upon observation, than the properties of the drugs *quoad* the human body. It is not routine practice, but penetrating investigation, which will introduce the next highly necessary improvements. New views of the human frame are requisite before the science of pathogenesy can attain to any degree of perfection. Among the first of these, we reckon that natural pathogenesis which the powers intrinsic to the body daily exercise upon it: viz, the powers of the mind, soul, and the inner man. By eliciting this, we shall get at the leading idea of pathogenesis, and also obtain rules for the succession of symptoms and states, as welling from a single fountain head. Otherwise, unless our eyes be thus armed by these greater knowledges, the various symptoms that drugs evoke in different parts of the frame, will seem to have no connection with each other, and the memory will be unable to retain them, at the same time that they will lie as so much incoherent dust in the way of the intellectual powers." (Page 387.)

"It would be interesting in the history of sciences to

canvass the reasons why certain large classes of facts have been rejected from time to time; why, for instance, the Church of Rome felt peculiarly aggrieved that the earth should go round the sun, and not *vice versa;* why certain moderns dislike to live on a planet which took more than seven days for its creation; why skeptics have a call to blink all evidence for spiritual communications, and afterwards opening their sockets widely complain of the absence of facts; and lastly, why the medical profession fumes and shivers whenever Mesmerism is brought forward. In all these cases, as we deem, it is the instinct of self-preservation that like a skin defends the parties against the reception of the facts. They know instinctively that the limitation and egg shell of their state is in danger, and that if the obnoxious point be admitted, they will have the trouble of building a new house on a larger scale. At present the pill-boxes are arranged in pretty rows; but allow this Mesmerism and its consequences, and how they would rattle and dance—what a long period of confusion and elimination they must pass, before any second order as neat as the first could be established! It is the dread of death, that shabbiest of fears, that everlastingly hates truth, because truth leads to death, future states, or integral enlargements, of which there is no end. Such is the motive of this very poor kind of conservatism, though there are as many pretexts as there are ingenious lazy minds who fancy that they have an interest in a well-arranged stagnation of the arts." (Page 391.)